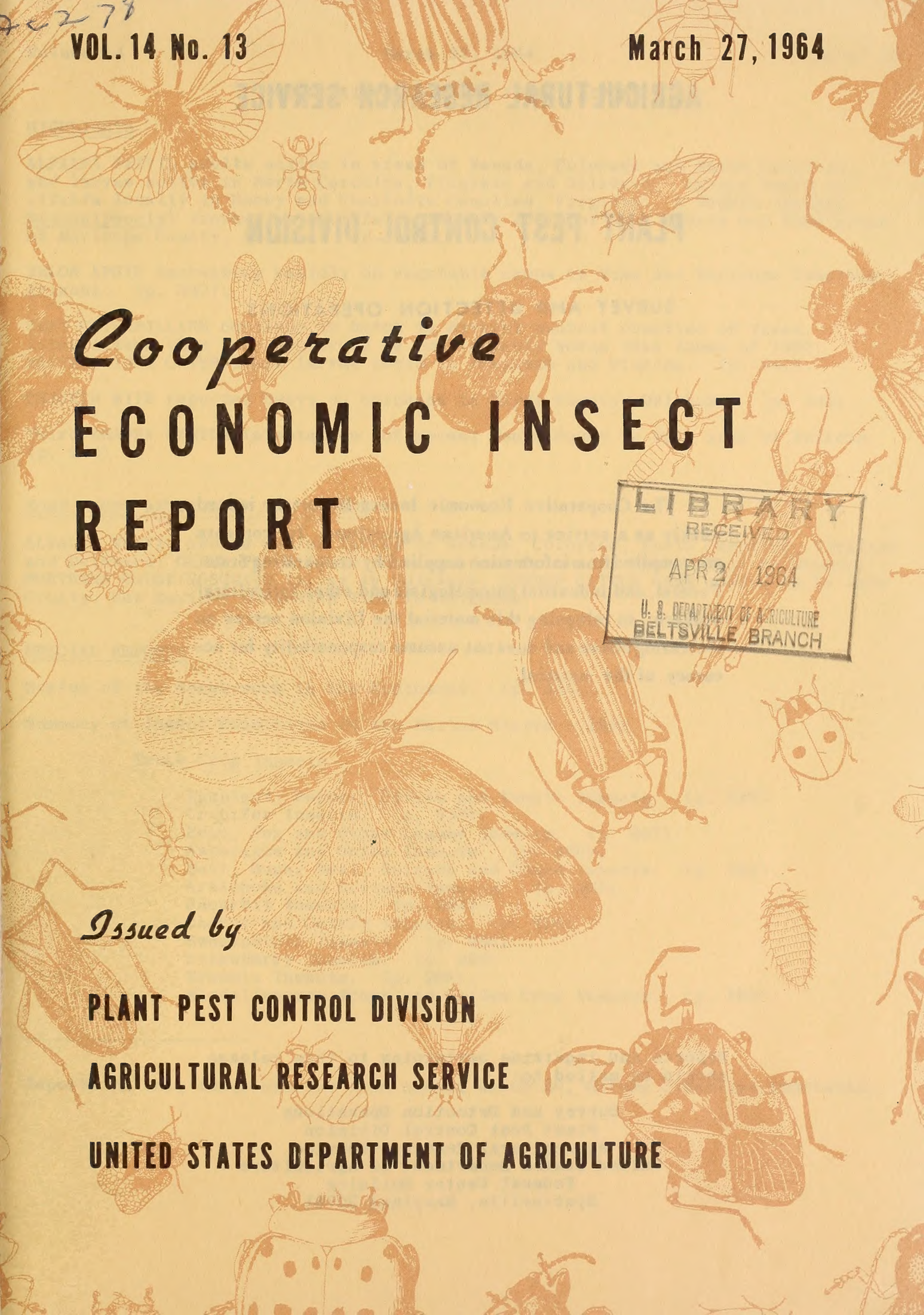
Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

7c2 77

VOL. 14 No. 13 March 27, 1964



Cooperative ECONOMIC INSECT REPORT

LIBRARY
RECEIVED
APR 2 1964
U. S. DEPARTMENT OF AGRICULTURE
BELTSVILLE BRANCH

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

Reports and inquiries pertaining to this release should be mailed to:

Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Federal Center Building
Hyattsville, Maryland 20781

Volume 14 March 27, 1964 Number 13

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

ALFALFA WEEVIL adults active in areas of Nevada, Colorado and North Carolina, and larvae active in North Carolina, Virginia and Delaware. Larvae heavy in alfalfa locally in Henry and Charlotte Counties, Virginia. A WEEVIL (*Hypera brunneipennis*) increasing on alfalfa in most areas of Yuma County and some areas of Maricopa County, Arizona. (p. 237).

MELON APHID increasing rapidly on vegetable crops in Yuma and Maricopa Counties, Arizona. (p. 240).

TENT CATERPILLARS continue to hatch in several central counties of Texas. Infestations this year appear to be considerably worse than those of 1963. EASTERN TENT CATERPILLAR larvae noted in Arkansas and Florida. (p. 241).

CHICKEN MITE reported heavy on chickens in Mayes County, Oklahoma. (p. 242).

Third KHAPRA BEETLE infestation of recent weeks found in Yuma area of Arizona. (p. 244).

SOME FIRST RECORDS OF THE SEASON

ALFALFA WEEVIL adults and/or larvae in Nevada, Colorado, North Carolina, Virginia and Delaware; GREEN PEACH APHID in Oregon and Colorado; PEAR PSYLLA in Oregon; NORTHERN HOUSE MOSQUITO larvae in Delaware; COMMON CATTLE GRUB adults in De Baca County, New Mexico; LONE STAR TICK in Oklahoma.

SPECIAL REPORTS

Status of the Screw-worm in the Southwest. (p. 243).

Summary of Insect Conditions in the United States - 1963

Truck Crop Insects

Eggplant, Pepper, Potato and Tomato Insects. (p. 247).
Crucifer Insects. (p. 253).
Bean, Pea and Other Legume Insects. (p. 257).
Asparagus and Onion Insects. (p. 260).
Beet, Sugar Beet, Spinach and Chard Insects. (p. 261).
Artichoke and Lettuce Insects. (p. 263).
Cucurbit Insects. (p. 264).
Carrot and Celery Insects. (p. 266)
Sweetpotato Insects. (p. 266).
Strawberry Insects. (p. 267).
Bramble Insects. (p. 268).
Miscellaneous Truck and Garden Crop Insects. (p. 269).

Reports in this issue are for week ending March 20, unless otherwise indicated.

WEATHER OF THE WEEK ENDING MARCH 23

Strong northerly winds brought cold arctic air into the northern Great Plains at the beginning of the week. Temperatures over northern Minnesota dropped far below zero. International Falls, Minnesota, registered 15° below zero Tuesday morning. Moderate temperatures prevailed over most of the rest of the Nation. Gusty winds, sometimes exceeding 40 m.p.h., raised dust clouds in southern California, Arizona, New Mexico, and over parts of the northern Great Plains. Clear skies prevailed over the southern half of the Nation. As the Far Southwest registered record breaking high temperatures, arctic air moved through the Northeast. Showers occurred in the Far Northwest with snow in the higher elevations of Washington, Oregon, Idaho, and Montana. By Wednesday a new storm was getting organized over the northern and central Great Plains. Snow fell over the northern Plains and upper Mississippi River Valley and thunderstorms spread through Oklahoma and Texas on Wednesday and eastward to the Atlantic Ocean on Thursday. New Orleans, Louisiana, registered 2.49 inches of rain on Thursday. Winds continued in the western Plains, reaching 42 m.p.h. at Pueblo, Colorado.

Although parts of Florida, California, and Texas registered temperatures in the 80's on Friday, March 20, blizzard conditions, heavy snow and biting winds prevailed throughout the Midwest. This storm, as it moved eastward, brought heavy snow to parts of Pennsylvania, Maryland, Delaware, New York, and New England. Baltimore, Maryland, received 10 inches of new snow late Saturday evening. As the storm moved out to the Atlantic Ocean, more severe weather developed in the Great Basin and the Rocky Mountains. Eight inches of snow fell at Salt Lake City on Sunday. By Monday morning, Billings, Montana, had received 10 inches of new snow and by noon Flagstaff, Arizona, had accumulated 9 inches. The temperature at Cutbank, Montana, dropped to 11° below zero Monday morning, March 23. Strong gusty winds caused blowing and drifting snow, clogging highways and closing schools. Severe dust storms occurred in the dry areas from New Mexico to Nebraska. At the end of the week, blizzard conditions - strong winds, falling temperatures, and the air filled with snow - continued over parts of the Rocky Mountains and the northern Great Plains. Winter still prevailed over much of the Nation.

Precipitation exceeded 1 inch at Astoria, Oregon, in the western portion of Washington, over parts of the central and southern Great Plains, along the Gulf of Mexico, and over northeastern Maryland and nearby portions of Pennsylvania and New Jersey. Most other areas received less than 1 inch. No important precipitation fell over most of the Great Basin and over the Rocky Mountains except in the extreme north.

Temperatures averaged above normal from Red Bluff and San Francisco, California, southeastward to Yuma and Phoenix, Arizona, over the northern Plateau from Havre, Montana, to Denver, Colorado, and Goodland, Kansas, and over the southern half of the Florida Peninsula. They averaged below normal over the rest of the Nation. Temperature departures ranged from -8° at Pocatello, Idaho, to +4° at Key West, Florida. (Summary supplied by U.S. Weather Bureau).

CEREAL AND FORAGE INSECTS

ALFALFA WEEVIL (Hypera postica) - NEVADA - Adults active in southern Washoe County. (Bechtel). COLORADO - Adult emergence slow in Arkansas River Valley area of Otero County. No adults observed. (Schweissing). No adult emergence noted in northeastern area or in Weld and Larimer Counties. Alfalfa showing very little growth. (Jenkins). NORTH CAROLINA - Larvae and adults averaged 104 and 8, respectively, per 50 sweeps in 10 alfalfa fields in vicinity of Wake Forest. Larvae ranged 50-210 per 50 sweeps. Alfalfa 3-4 inches high and did not receive fall treatment. (Mount). VIRGINIA - Larvae heavily infesting alfalfa locally near Martinsville, Henry County; ranged 5-8 per tip and most in first stage. Alfalfa now 3-4 inches high. No adults detected. (Pienkowski, Mar. 16). Severe larval infestations detected on 2 farms about 5 miles apart in Red Oak section of Charlotte County. (Morton, Mar. 18). Larvae expected to appear in other areas of State soon, possibly much earlier than usual if above-normal temperatures continue. (Tarpley). TENNESSEE - First and second instars scattered in alfalfa over State. (Mullett). DELAWARE - First-stage larvae in New Castle County alfalfa. (Burbutis).

A WEEVIL (Hypera brunneipennis) - ARIZONA - Increasing on alfalfa in nearly all areas of Yuma County and in some areas of Maricopa County. Some pupation occurring on Yuma Mesa, Yuma County. Many parasitized larvae found in all areas. (Ariz. Coop. Sur.).

CLOVER HEAD WEEVIL (Hypera meles) - ALABAMA - Few adults noted in flight in Dallas County. (Shuler, Grandberry).

SOUTHERN CORN ROOTWORM (Diabrotica undecimpunctata howardi) - ALABAMA - Adults about 1 per 3 sweeps in crimson clover-vetch mixture in Dallas and Montgomery Counties. (Shuler et al.).

ALFALFA CATERPILLAR (Colias eurytheme) - ARIZONA - Infestations general on alfalfa in Yuma County and in Buckeye and Mesa areas of Maricopa County; larvae 20-40 per 100 sweeps. (Ariz. Coop. Sur.). ALABAMA - Numerous adults in flight and laying eggs on clovers in Dallas County. (Shuler et al.).

ARMY CUTWORM (Chorizagrotis auxiliaris) - OKLAHOMA - Continues low throughout northwest. (Okla. Coop. Sur.).

A LEAF ROLLER MOTH (Platynota stultana) - ARIZONA - Averaged 10 per 100 sweeps on alfalfa in north Gila Valley, Yuma County. (Ariz. Coop. Sur.).

PEA APHID (Acyrthosiphon pisum) - ARIZONA - Increasing somewhat, although only light to medium infestations found on alfalfa in Yuma and Maricopa Counties. (Ariz. Coop. Sur.). NEVADA - Very light, spotted populations on alfalfa in Virgin Valley, Clark County, and only occasional specimens found on alfalfa in southern Washoe County. (Bechtel). OKLAHOMA - None found in east central area alfalfa. (Okla. Coop. Sur.). ARKANSAS - Populations remain at about 5-10 per square foot in vetch in northwest. (Ark. Ins. Sur.). FLORIDA - Increasing on Hairy Peruvian alfalfa at Gainesville; approximately 1,800-2,500 per 200 sweeps. (Mead). DELAWARE - Small nymphs present on alfalfa in New Castle County. (Burbutis).

SPOTTED ALFALFA APHID (Therioaphis maculata) - NEVADA - Only occasional specimens found in alfalfa in Virgin Valley, Clark County. (Bechtel). ARIZONA - Light on alfalfa in Yuma and Maricopa Counties. (Ariz. Coop. Sur.). OKLAHOMA - Occasionally noted in some overwintering alfalfa in east central area and in Garvin County, south central area. (Okla. Coop. Sur.).

COWPEA APHID (Aphis craccivora) - ARIZONA - Light on old, established stands of alfalfa in north Gila Valley, Yuma County. (Ariz. Coop. Sur.).

TARNISHED PLANT BUG (*Lygus lineolaris*) - ALABAMA - Averaged about 1 per 3 sweeps in crimson clover-vetch mixture in Dallas and Montgomery Counties. (Shuler et al.). OKLAHOMA - Light on alfalfa in east central area. (Okla. Coop. Sur.).

LYGUS BUGS (*Lygus* spp.) - ARIZONA - Continue low on alfalfa in Yuma and Maricopa Counties; adults averaged 14 per 100 sweeps. Very few nymphs beginning to appear. (Ariz. Coop. Sur.).

THREE-CORNERED ALFALFA HOPPER (*Spissistilus festinus*) - ALABAMA - Averaged 1 per 5 sweeps in crimson clover-vetch mixture in Dallas and Montgomery Counties. (Shuler et al.). FLORIDA - Adult counts 8 per 200 sweeps on alfalfa and 1 per 100 sweeps on blue lupine at Gainesville, Alachua County. (Mead).

LEAFHOPPERS - FLORIDA - Adult counts per 100 sweeps on flowering blue lupine at Gainesville, Alachua County, were 6 *Cuerna costalis*, 3 *Agallia constricta*, and 1 *Empoasca* sp. (Mead).

CLOVER MITE (*Bryobia praetiosa*) - ARIZONA - Medium to heavy on alfalfa in Yuma and Maricopa Counties. (Ariz. Coop. Sur.).

GREENBUG (*Schizaphis graminum*) - OKLAHOMA - Continues noneconomic throughout State; negative in many areas. Some reproduction noted in Perkins area of Payne County on warm days. (Okla. Coop. Sur.).

ENGLISH GRAIN APHID (*Macrosiphum avenae*) - ARIZONA - Light to medium in fields of grain in Yuma and Maricopa Counties. (Ariz. Coop. Sur.).

CORN LEAF APHID (*Rhopalosiphum maidis*) - NEW MEXICO - Light, spotted infestations of only minor importance in barley fields in southern counties. (N. M. Coop. Rpt.).

A GRASS BUG (*Arhyssus scutatus*) - CALIFORNIA - Adults heavy in field grasses in Stockton, San Joaquin County. (Cal. Coop. Rpt.).

SIX-SPOTTED LEAFHOPPER (*Macrosteles fascifrons*) - FLORIDA - Adults 7 per 100 sweeps on rye at Gainesville, Alachua County. (Mead).

EUROPEAN CORN BORER (*Ostrinia nubilalis*) - DELAWARE - Overwintered borer population in New Castle County averaged, for 3 fields, 32 borers per 100 stalks on March 16; percent reduction from estimated fall population 52 percent. (Burbutis).

A SCARAB (*Euphoria sepulchralis*) - FLORIDA - Lightly infesting ears of corn at Goulds, Dade County. (Knowles, Mar. 12).

TEXAS LEAF-CUTTING ANT (*Atta texana*) - TEXAS - Continues to cause considerable concern to residents in south and southwest areas; controls applied by many landowners. (Tex. Coop. Rpt., Meisch).

BROWN WHEAT MITE (*Petrobia latens*) - OKLAHOMA - Light on wheat in Woods, Harper, Woodward and Dewey Counties; ranged 1-20 per linear foot, but one field in Harper County had 150 per linear foot. (Okla. Coop. Sur.). ARIZONA - Few light infestations in Yuma County alfalfa, particularly on Yuma Mesa. (Ariz. Coop. Sur.).

WINTER GRAIN MITE (*Penthaleus major*) - CALIFORNIA - Adults light to medium on leaves of range grasses in Coalinga, Fresno County. (Cal. Coop. Rpt.).

FRUIT INSECTS

LESSER PEACH TREE BORER (Synanthedon pictipes) - ALABAMA - Serious damage appearing on isolated limbs and tree trunks of peaches as sap flow begins and larval feeding is more intense in Geneva and other counties. (Reynolds et al.).

PEACH TWIG BORER (Anarsia lineatella) - CALIFORNIA - Medium in almond trees in Madison, Yolo County. (Cal. Coop. Rpt.). OREGON - Not yet moving from hibernaculae in Jackson County pear orchards (feeding on buds on March 9 of last year). (Berry).

A BLASTOBASID MOTH (Holcocera iceryaeella) - CALIFORNIA - Larvae medium on citrus in Salinas, Monterey County, and light locally on orange trees in Oxnard, Ventura County. (Cal. Coop. Rpt.).

GREEN PEACH APHID (Myzus persicae) - OREGON - Eggs noted hatching February 24 and now on developing buds of peach and pear trees in Jackson County. (Berry). COLORADO - Beginning to hatch in Mesa County. (Bulla).

APHIDS - DELAWARE - Nymphs found on apple buds in Kent County March 19. (MacCreary).

PEAR PSYLLA (Psylla pyricola) - OREGON - Adults noted actively laying eggs on pear twigs in Jackson County. Egg laying very heavy in some orchards and appears to be greater than last year. (Berry).

Citrus Insect Situation in Florida - Mid-March - CITRUS RUST MITE (Phyllocoptruta oleivora) on leaves infested 52 percent of groves (norm 60 percent); 33 percent economic (norm 35 percent). Citrus rust mite on fruit infested 42 percent of groves (norm 48 percent); 22 percent economic (norm 29 percent). Population below normal. Further decrease into low range expected. Highest districts west, north and south. TEXAS CITRUS MITE (Eutetranychus banksi) infested 31 percent of groves (norm 21 percent); 16 percent economic (norm 8 percent). Population higher than in March of prior years, but only scattered infestations important. Slight increase expected. Highest districts central and east. CITRUS RED MITE (Panonychus citri) infested 46 percent of groves (norm 64 percent); 21 percent economic (norm 36 percent). Below average abundance but important in scattered groves. Increase expected. Highest districts north,central and west. SIX-SPOTTED MITE (Eotetranychus sexmaculatus) very low in all districts. PURPLE SCALE (Lepidosaphes beckii) infested 83 percent of groves (norm 80 percent); 7 percent economic (norm 15 percent). GLOVER SCALE (L. gloverii) infested 72 percent of groves (norm 26 percent); 11 percent economic (norm 1 percent). CHAFF SCALE (Parlatoria pergandii) infested 80 percent of groves (norm 42 percent); 16 percent economic (norm 1 percent). YELLOW SCALE (Aonidiella citrina) infested 42 percent of groves (norm 9 percent); 9 percent economic (norm 1 percent). BLACK SCALE (Saissetia oleae) infested 14 percent of groves (norm 17 percent); 6 percent economic (norm 4 percent). Scale populations will increase gradually. Only a few scattered infestations will be important. Immature WHITEFLY populations continued much above average. Lower larval population forecast which will coincide with sharp increase in adult and egg populations during March and April. Populations of APHIDS increased sharply in March and will continue to increase through April. Some important infestations will occur in all districts but generally will be lighter and less numerous than average. (W. A. Simanton (Citrus Expt. Sta., Lake Alfred)).

OBSCURE SCALE (Chrysomphalus obscurus) - TEXAS - Infestations on pecan trees in Brazos County appear to be increasing (Randolph).

GREEDY SCALE (Aspidiotus camelliae) - CALIFORNIA - Heavy on olive trees in Tracy, San Joaquin County. (Cal. Coop. Rpt.).

SAN JOSE SCALE (Aspidiotus perniciosus) - FLORIDA - Severe on pear at Glen St. Mary, Baker County. (Collins, Mar. 13). OREGON - Infestations more than normal in Jackson County fruit trees. (Berry).

OLIVE SCALE (Parlatoria oleae) - CALIFORNIA - Heavy on olive trees in Tracy, San Joaquin County. (Cal. Coop. Rpt.).

FIG SCALE (Lepidosaphes ficus) - CALIFORNIA - Adults medium on fig trees in Sacramento, Sacramento County. (Cal. Coop. Rpt.).

SOFT SCALES (Lecanium spp.) - COLORADO - Crawler activity noted in Delta County. (Bulla).

PACIFIC SPIDER MITE (Tetranychus pacificus) - CALIFORNIA - Nymphs and adults heavy on almond trees in Ripon, San Joaquin County. (Cal. Coop. Rpt.).

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) - OREGON - Moving into developing buds in Jackson County pear orchards; heavy in some orchards. (Berry).

EUROPEAN RED MITE (Panonychus ulmi) - OREGON - Eggs more noticeable in Jackson County Anjou pear orchards than in several years. (Berry).

PEAR RUST MITE (Epitrimerus pyri) - OREGON - Moving from overwintering quarters in bark scales to developing buds in Jackson County pear orchards. (Berry).

TRUCK CROP INSECTS

MELON APHID (Aphis gossypii) - ARIZONA - Rapidly increasing in vegetable crops of Yuma and Maricopa Counties. Medium in nearly all areas. (Ariz. Coop. Sur.).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Increasing slowly in lettuce fields of Yuma and Maricopa Counties. (Ariz. Coop. Sur.).

AN APHID (Acyrthosiphon barri) - ARIZONA - Light on lettuce fields in the Dome Valley of Yuma County. (Ariz. Coop. Sur.).

BEET LEAFHOPPER (Circulifer tenellus) - ARIZONA - Increasing on weed hosts near cantaloup fields in Yuma and Maricopa Counties. (Ariz. Coop. Sur.).

WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata undecimpunctata) - OREGON - Adults active in mid-February in Forest Grove area, Washington County. (Getzendarer).

IMPORTED CABBAGEWORM (Pieris rapae) - ALABAMA - Few adults noted in flight around gardens and clovers in Dallas, Lowndes and Autauga Counties. (Shuler et al.).

A CUTWORM - OKLAHOMA - Undetermined species heavy in gardens in Stephens County. (Okla. Coop. Sur.).

A LEAF MINER FLY (Liriomyza sp.) - FLORIDA - Caused light to medium damage to all of 200 celery plants inspected at Sanford, Seminole County. (Desin).

TOBACCO INSECTS

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - GEORGIA - Light on tobacco in the plant bed in southern area. (Johnson).

TOBACCO FLEA BEETLE (Epitrix hirtipennis) - GEORGIA - Light on tobacco in the plant bed in southern area. (Johnson).

COTTON INSECTS

EARWIGS - TEXAS - Heavy, local populations of unspecified species damaging cotton in Cameron County. Counts one per 4 inches in a 20-acre field of cotton that followed fall grain. (Tex. Coop. Rpt., Stephens).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

SOUTHERN PINE BEETLE (*Dendroctonus frontalis*) - ALABAMA - Approximately 6 acres of 7-year-old pine planting completely destroyed in west Crenshaw County. At another area in Covington County, small pines (4-6 inches) in groups of 2-4 trees at scattered points in large timber company area damaged and killed. (Stephenson, Mar. 13).

PINE APHIDS - ALABAMA - Unspecified species becoming heavy on young pines in Baldwin County. (Wilson).

A SPIDER MITE (*Oligonychus coniferarum*) - CALIFORNIA - Eggs, nymphs and adults medium on juniper trees in Fullerton, Orange County. (Cal. Coop. Rpt.).

TENT CATERPILLARS (*Malacosoma* spp.) - TEXAS - *M. disstria* and *Malacosoma* sp., probably *texana*, continue to hatch in several central counties. Infestations this year appear to be considerably worse than those of 1963. (Tex. Coop. Rpt., Meisch).

EASTERN TENT CATERPILLAR (*Malacosoma americanum*) - ARKANSAS - Young larvae collected from ornamental peach in Faulkner County (central). This is first report of season. (Ark. Ins. Sur.). FLORIDA - Full-grown larva noted on ground at Gainesville, Alachua County; possibly seeking pupation site. (Hetrick, Mead).

SPRING CANKERWORM (*Paleacrita vernata*) - SOUTH DAKOTA - Active in Yankton County. (Hintz). KANSAS - Males flying in moderate numbers during past 2 weeks in Riley County. No females seen. (Thompson, Peters).

A COSMOPTERIGID MOTH (*Periploca ceanothiella*) - CALIFORNIA - Medium in twigs of ceanothus in Paso Robles, San Luis Obispo County. (Cal. Coop. Rpt.).

APHIDS - ALABAMA - *Macrosiphum rosae* ranged light to heavy on isolated roses in Dallas and Lee Counties. Syrphid flies laying numerous eggs among aphids. (Shuler et al.). Clumps of *Longistigma caryae* eggs (50-100) on ornamental oaks on lawns in Lee County have now hatched; nymphs feeding on branches. Few syrphid fly larvae feeding on aphids. (McQueen). OKLAHOMA - Unspecified species light on landscape plantings in Garvin County area. (Okla. Coop. Sur.). CALIFORNIA - *Neophyllaphis podocarpi* nymphs and adults heavy on *Podocarpus macrophylla* in Fullerton, Orange County. (Cal. Coop. Rpt., Mar. 6).

A PSYLLID (*Trioza magnoliae*) - FLORIDA - Adults common on foliage of redbay (*Persea borbonia*) at Gainesville, Alachua County. (Hetrick, Mead).

OYSTERSHELL SCALE (*Lepidosaphes ulmi*) - CALIFORNIA - Heavy on lilac bushes in Lafayette, Contra Costa County. (Cal. Coop. Rpt.).

WHITE PEACH SCALE (*Pseudaulacaspis pentagona*) - VIRGINIA - Heavy on shrubs and trees at a location in Richmond (Rowell, Mar. 16) and infesting mulberry at a location in Dragon Run watershed, King and Queen County (Tarpley, Sedivy; Mar. 11). Det. by M. Kosztarab. (Tarpley).

CITRUS MEALYBUG (*Pseudococcus citri*) - VIRGINIA - Heavy on *Diffenbachia* sp. at a location in Blacksburg, Montgomery County (Tarpley, Mar. 9), and undetermined house plants at a location in Rileyville, Page County (Tarpley, Saunders; Mar. 5). Det. by M. Kosztarab as *Planococcus citri*. (Tarpley).

A MEALYBUG (Rhizoecus pritchardi) - CALIFORNIA - Medium on African violets in Visalia, Tulare County. (Cal. Coop. Rpt.).

SOFT SCALES - CALIFORNIA - Toumeyella pinicola heavy on Pinus radiata in Millbrae, San Mateo County. Lecanium pruinosum medium on trumpetvine locally in Sacramento, Sacramento County. (Cal. Coop. Rpt.).

LESSER BULB FLY (Eumerus tuberculatus) - CALIFORNIA - Larvae and pupae heavy in narcissus in Hanford, Kings County. (Cal. Coop. Rpt.).

CITRUS RED MITE (Panonychus citri) - ALABAMA - Observed feeding and causing considerable damage to cherry-laurel during winter throughout central part of State. (McQueen).

SPIDER MITES (Tetranychus spp.) - ALABAMA - Heavy and damaging azaleas in southern Baldwin County. Egg, nymphs and adults plentiful. (Oates, Wilson).

PRIVET MITE (Brevipalpus obovatus) - CALIFORNIA - Adults heavy on Fatsia japonica nursery stock in Thousand Oaks, Ventura County. (Cal. Coop. Rpt.).

INSECTS AFFECTING MAN AND ANIMALS

MOSQUITOES - DELAWARE - First-stage larvae of Culex pipiens pipiens noted in wooded area in northern New Castle County. (F. Murphey). TEXAS - In Jefferson County, adults noted around lights on some warmer nights; also observed in sheltered locations during the day. Aedes sollicitans, Culiseta inornata, Anopheles quadrimaculatus, Anopheles crucians and Culex spp. have been noted. (Jeff. Co. Mosq. Control Comm.).

HORN FLY (Haematobia irritans) - OKLAHOMA - Counts continue low on cattle in Payne County. (Okla. Coop. Sur.).

NORTHERN CATTLE GRUB (Hypoderma bovis) - NORTH CAROLINA - Present in backs of 2 of 16 young cows and one of 24 heifers examined in Wake County, March 18. One grub in second stage; other 2 had been in backs about 2 weeks. Group of animals at same location had average of 4.9 grubs per head on March 8, 1963. (Mount).

COMMON CATTLE GRUB (Hypoderma lineatum) - NEW MEXICO - Adults molesting cattle in De Baca County. (N. M. Coop. Rpt.).

CATTLE GRUBS (Hypoderma spp.) - UTAH - Ranged from 25 to more than 50 in backs of some cattle recently shipped from Loa, Wayne County, to Utah County. Few appearing in backs of cattle in herds in American Fork area of Utah County. (Knowlton).

BLACK FLIES (Simulium spp.) - FLORIDA - Simulium sp., probably slossonae, noted attacking heads and necks of chickens at Lutz (Mar. 6), and Simulium sp., probably jenningsi, troublesome to poultry at Tampa (Mar. 13), both in Hillsborough County. (O'Quinn).

LONG-NOSED CATTLE LOUSE (Linognathus vituli) - GEORGIA - Averaged 1 per square inch on 100 Hereford animals examined in Spalding County, and 6.58 per animal on 10 Hereford cattle examined in Putnam County. (Roberts, Mar. 10).

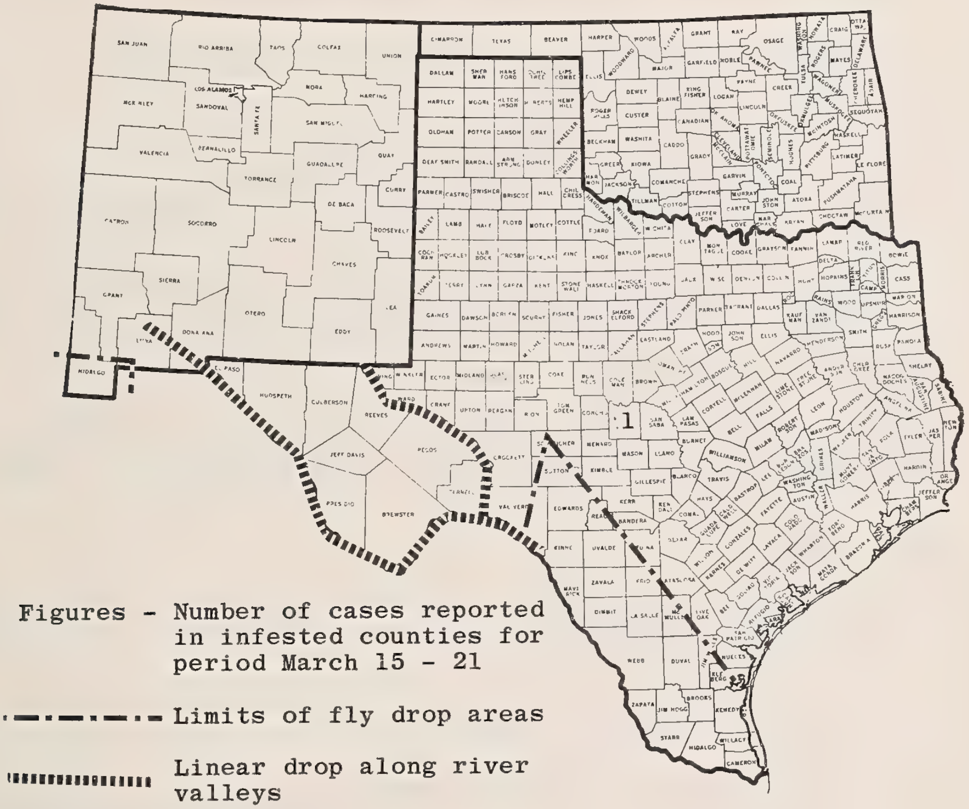
CATTLE LICE - OKLAHOMA - Several species continue moderate to heavy in southeast and south central areas; light to moderate in Payne County area. (Okla. Coop. Sur.). UTAH - Numerous in many Utah County herds; controls planned. (Knowlton).

CHICKEN MITE (Dermanyssus gallinae) - OKLAHOMA - Heavy populations reported on chickens in Mayes County (northeast). (Okla. Coop. Sur.).

LONE STAR TICK (Amblyomma americanum) - OKLAHOMA - Light populations becoming active in Pushmataha and Latimer Counties (southeast). (Okla. Coop. Sur.).

STATUS OF THE SCREW-WORM (Cochliomyia hominivorax) IN THE SOUTHWEST

During the period March 15-21, one screw-worm case was disclosed in TEXAS; occurred in a bovine on ranch near Brady, McCulloch County. Larvae collected by practicing veterinarian; determined as 29 Phormia regina and 1 second-stage Cochliomyia hominivorax. A total of 104,663,050 sterile screw-worm flies was released during the period. Livestock producers submitted total of 129 larval samples identified as nonscrew-worm. (Anim. Dis. Erad. Div.).


1
Figures - Number of cases reported in infested counties for period March 15 - 21
Limits of fly drop areas
Linear drop along river valleys

HOUSEHOLD AND STRUCTURAL INSECTS

CLOVER MITE (Bryobia praetiosa) - NEVADA - Homeowner complaints increasing as movement into homes becomes more numerous in Reno-Sparks area, Washoe County. (Lauderdale). UTAH - Entering homes at Provo and American Fork, Utah County. (Knowlton). COLORADO - Complaints reported from Conejos County; also troublesome in hospital in Larimer County. (Thatcher et al.). ARIZONA - Appearing in many homes in Phoenix area, Pima County. (Ariz. Coop. Sur.). NORTH CAROLINA - Large numbers present at a Burke County location March 13, and troublesome at a Montgomery County location March 11. (Wray, Garris). VIRGINIA - Common at a Lynchburg location, Campbell County. (Rowell, Mar. 13). MARYLAND - Troublesome at a location in Rockville, Montgomery County. (U. Md., Ent. Dept.).

BOXELDER BUG (Leptocoris trivittatus) - PENNSYLVANIA - Numerous in homes and on sides of buildings at several locations in Washington County. (Udine, Mar. 13). MARYLAND - Annoyed several homeowners in Carroll County and at Baltimore. (U. Md., Ent. Dept.). VIRGINIA - Adults common in and around homes in Roanoke and in Vinton, Roanoke County; Pearisburg, Giles County; and Tappahannock, Essex County, March 8, 9 and 10. (Rowell). NORTH CAROLINA - A nuisance in Moore County, and about several homes near Cramerton, Gaston County. (Allen, Erwin). WISCONSIN - Continues to be annoying. (Wis. Ins. Sur.).

SQUASH BUG (Anasa tristis) - NEVADA - Overwintering adults entering homes and causing concern in Reno-Sparks area, Washoe County. (Coop. Rpt.).

INDIAN-MEAL MOTH (Plodia interpunctella) - OKLAHOMA - Causing concern in Stillwater area homes, Payne County. (Okla. Coop. Sur.).

ELM LEAF BEETLE (Galerucella xanthomelaena) - TEXAS - Light to moderate adult numbers invading homes in Collingsworth County. (Regier). OKLAHOMA - Overwintering adults leaving hibernation quarters continue to cause concern in homes. (Okla. Coop. Sur.).

BLACK LARDER BEETLE (Dermestes ater) - PENNSYLVANIA - Troublesome at a location in Allentown, Lehigh County, all winter. Det. by J. M. Kingsolver. (Menusan).

EASTERN SUBTERRANEAN TERMITE (Reticulitermes flavipes) - MISSOURI - Adults swarming at location in Boone County (central). (Houser, Thomas, Wood). NORTH CAROLINA - Swarmed March 17 at a Surry County location; also reported from a Bertie County location. (Wray). GEORGIA - Light at a location in Griffin, Spalding County. (Roberts, Feb. 12).

SUBTERRANEAN TERMITES (Reticulitermes spp.) - MARYLAND - Swarming occurring in and around buildings at several locations over State. (U. Md., Ent. Dept.).

TERMITES - VIRGINIA - Adults noted at a location in Orange, Orange County, March 7. (Tarpley, Dunlap).

SOUTHERN LYCTUS BEETLE (Lyctus planicollis) - ALABAMA - Severe infestation present in home in Lauderdale County. (Pitts, Balsbaugh, Ledbetter).

STORED-PRODUCT INSECTS

KHAPRA BEETLE (Trogoderma granarium) - ARIZONA - Third infestation of recent weeks found in Yuma area; presumably originating from infestation reported in CEIR 14(12): 217. (Ariz. Coop. Sur.).

RED FLOUR BEETLE (Tribolium castaneum) - CALIFORNIA - Heavy in wheat and rice pellets in feedstore in San Martin, Santa Clara County. (Richardson, Alvarez).

RICE WEEVIL (Sitophilus oryzae) - TEXAS - This species, in combination with Prostephanus truncatus, causing considerable damage to stored corn in Washington County. (Tex. Coop. Rpt.; McClung).

A GRAIN BORER (Prostephanus truncatus) - TEXAS - Heavy, localized populations damaging corn in Washington County. (Tex. Coop. Rpt.; McClung).

AN ACARID MITE (Caloglyphus berlesei) - CALIFORNIA - Heavy in mixed feeds in warehouse in Kingsburg, Tulare County. (Hogan, Gilley).

BENEFICIAL INSECTS

GOLDEN-EYE LACEWING (Chrysopa oculata) - TEXAS - Heavy, localized populations present in small grain in Brazos County. (Randolph). WISCONSIN - Adults and various species of flies noted active on warmer days. (Wis. Ins. Sur.).

A LADY BEETLE (Coleomegilla maculata) - VIRGINIA - Hibernating adults found in leaves around shrubs at home in Richmond (Tarpley, Mar. 6); found under similar conditions in Tazewell, Tazewell County (Tarpley, Sisk; Mar. 12).

FLOWER FLIES - TEXAS - Larvae present in large numbers in localized small grain in Brazos County. (Randolph).

Beneficial Insects in Alabama - DRAGONFLIES, CONVERGENT LADY BEETLE (*Hippodamia convergens*), *Coleomegilla maculata fuscilabris*, FLOWER FLIES, NABIDS, A BIG-EYED BUG (*Geocoris punctipes*) and BROWN LACEWINGS (*Micromus* spp.) observed active, feeding and laying eggs in Dallas, Montgomery and Lee Counties. (Shuler et al.).

A PARASITIC BRACONID (*Trioxys utilis*) - WISCONSIN - This parasite of spotted alfalfa aphid (*Therioaphis maculata*) confirmed; parasites reared from aphids collected and maintained by University of Wisconsin researchers. (Wis. Ins. Sur.).

MISCELLANEOUS INSECTS

HOUSE FLIES - OREGON - Large numbers of adults of unspecified species infested with entomophagous fungi in laboratory at Forest Grove, Washington County. (Prescott).

IMPORTED FIRE ANT (*Solenopsis saevissima richteri*) - FLORIDA - Light on shoulder of State Road 2, one mile east of Malone, Jackson County, (Mar. 4); light on shoulder of State Road 277, 4.5 miles northeast of Vernon, Washington County (Mar. 6). (Tipton). Light in grass at Tallahassee, Leon County, (Johnson, Mar. 4); and light on highway shoulder at West Mulberry, Polk County (Richards, Mar. 13). These are new township records in known infested counties. (Fla. Coop. Sur.). Infested soil of 3 poplar plants in cans at nursery in Chattahoochee, Gadsden County. (Miller, Mar. 11).

Sticky-board Traps in Arizona - Average count per board in Yuma County as follows: Green peach aphid (*Myzus persicae*) 3.58; melon aphid (*Aphis gossypii*) 14.9; and beet leafhopper (*Circulifer tenellus*) 0.17. Twelve boards used. (Ariz. Coop. Sur.).

LIGHT TRAP COLLECTIONS

	Temperature °F	Precipitation	Type of trap *	*Agrotis ipsilon* (black cutworm)	*Carpocapsa pomonella* (codling moth)	*Chorizagrotis auxiliaris* (army cutworm)	*Estigmene acrea* (salt-marsh caterpillar)	*Faronta diffusa* (wheat head armyworm)	*Feltia subterranea* (granulate cutworm)	*Heliothis virescens* (tobacco budworm)	*Heliothis zea* (bollworm, corn earworm)	*Laphygma frugiperda* (fall armyworm)	*Loxostege commixtalis* (alfalfa webworm)	*Loxostege similalis* (garden webworm)	*Loxostege sticticalis* (beet webworm)	*Ostrinia nubilalis* (European corn borer)	*Peridroma saucia* (variegated cutworm)	*Prodenia ornithogalli* (yellow-striped armyworm)	*Protoparce quinquemaculata* (tomato hornworm)	*Protoparce sexta* (tobacco hornworm)	*Pseudaletia unipuncta* (armyworm)	*Spodoptera exigua* (beet armyworm)	*Trichoplusia ni* (cabbage looper)	Major crop **
CALIFORNIA Davis 3/14-20																	14							
FLORIDA Gainesville 3/17			BL	1					4		1													
GEORGIA Tifton 3/12-18			BL							0	1								0	0				
MISSISSIPPI Stoneville 3/14-20	37-88	1.37"	MV	2													5	3			7			
			BL	1														1			7			
TEXAS Waco 3/14-20			BL	4			0		2	0	2	0					15	0			6	2	2	

* BL = blacklight; I = incandescent; MV = mercury vapor ; O = other

** alf. = alfalfa; beet = garden beet and/or sugar beet; cole = cole crops (crucifers); cott. = cotton; FC = field corn, grain = small grains; leg. = legumes (unspecified); lett. = lettuce; pean. = peanut; pepp. = pepper; pot. = potatoes; SC = sweet corn; sol. = solanaceous plants (unspecified); soy. = soybean; TC = truck crops (unspecified or mixed); tob. = tobacco; tom. = tomato.

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1963

(continued from page 234)

TRUCK CROP INSECTS

EGGPLANT, PEPPER, POTATO AND TOMATO INSECTS

Highlights:

COLORADO POTATO BEETLE is increasing in importance on potatoes and tomatoes in Pennsylvania, and was quite destructive to these crops in all sections of Maryland during 1963. The pest was more numerous on the Eastern Shore of Virginia than potato growers could recall, and was more numerous and damage greater than usual in Michigan and Utah. POTATO FLEA BEETLE ranged moderate to heavy and caused moderate to heavy damage to tomatoes in areas of Maine, and was very active and damaging to same crop in Vermont. Larval damage to potato tubers was considerably more serious in New Castle and Kent Counties, Delaware, than in 1962. The pest was abundant throughout much of Montana, with many tons of potatoes going into storage damaged by larvae. CABBAGE LOOPER was a greater problem on the Eastern Shore of Virginia than any year since 1959, and was a problem on chili peppers in New Mexico. BLACK CUTWORM was especially abundant in Virginia, with up to 25 percent of potato tubers injured in some localities. POTATO TUBERWORM was found infesting potatovines in Monroe County, Michigan, and Lucas County, Ohio, during 1963. The greatest loss from EUROPEAN CORN BORER in Alabama during 1963 was to 4,000 acres of pimento peppers in Marshall, De Kalb and Blount Counties, where larvae entered the fruit. Overall APHID populations on potatoes in Maine, by June 28, were 4 times the 1962 level and twice the 1961 level for the same date. Buckthorn aphid and potato aphid were the predominant species at that time. GREEN PEACH APHID was heavier than usual on spring potatoes in Virginia, ranged moderate to heavy on early potatoes in Weld County, Colorado, and necessitated controls during late July and August on potatoes in eastern Washington. POTATO LEAFHOPPER was considerably above normal in Maryland, causing extensive damage to potatoes, peppers and other crops in most sections, and was the most serious vegetable pest in Ohio. POTATO PSYLLID populations were the heaviest in several years in Nevada, but were markedly smaller in Wyoming than in 1962. Populations on native hosts in Colorado early in the spring were in numbers that in most years would have been a threat to potatoes; however, the weather became hot and dry and damaging populations did not develop on potatoes. PEPPER MAGGOT was serious on commercial peppers in New Jersey and in Warren, Vance and Wake Counties, North Carolina. TWO-SPOTTED SPIDER MITE caused extensive damage to tomato and eggplant in New Jersey, and unseasonably hot weather during August and September in central Washington was conducive to rapid buildup and damage on potatoes and other crops.

COLORADO POTATO BEETLE (Leptinotarsa decemlineata) populations were heavy and caused severe damage to potatoes in Saco, York County, MAINE, and an overwintered adult was seen on a potato plant in a field 5 miles south of Presque Isle, Aroostook County, on July 6. In MASSACHUSETTS, adults were present in many potato fields, with plants along margins of some fields chewed off as leaves developed. Oviposition was underway by June 14, and controls were urged. First adults of the season in RHODE ISLAND appeared in Kingston, Washington County, and in Middletown, Newport County, in mid-May. Oviposition was general by May 31 and hatching was underway by June 13. Infestation by this pest was heavier on Aquidneck Island, Newport County, than in the remainder of the State. Colorado potato beetle populations in NEW JERSEY were at the highest levels during the 1963 season than since the advent of the use of DDT. The pest is increasing in importance on potatoes and tomatoes in the eastern portion of PENNSYLVANIA. Colorado potato beetle adults were first observed feeding on young tomato transplants in DELAWARE on April 24 in Sussex County. Several severe infestations of the beetle occurred on tomatoes in various areas of the State during June, July and August, but the majority of tomato fields were not heavily infested. Colorado potato beetle was quite destructive to potatoes and tomatoes in all sections of MARYLAND, with many commercial fields being heavily damaged. In the summer, eggplant was injured at several localities. Both broods of this potato pest were more numerous on the Eastern Shore of VIRGINIA than potato growers could recall. In early July, tremendous numbers moved out of harvested potato fields and caused some damage to tomatoes, eggplants and peppers in the area.

All reports of damage by Colorado potato beetle in MISSOURI were from the west central and northwest areas of the State during the 1963 season. Populations of the pest were higher and damage was greater than usual in MICHIGAN, but the species was generally not a problem in NORTH DAKOTA. Colorado potato beetle was numerous over a large portion of MONTANA, especially in the counties of the extreme west, and caused considerable trouble in the Corvallis area of Ravalli County. Light infestations occurred in some areas of WYOMING during the season. Adults were common on buffalo bur, highest numbers being found in Goshen and Laramie Counties. Generally, infestations were lower in Wyoming during 1963 than in 1962. Colorado potato beetle occurred in large numbers in early potato fields in Buffalo, Red Willow and Webster Counties, NEBRASKA. In COLORADO, the pest moved from weed hosts into potato fields early in the season and caused considerable foliage damage in some fields. Approximately 5 percent of the acreage in Weld County was infested. Colorado potato beetle was more abundant and/or more damaging than normal in UTAH during 1963. The pest emerged from hibernation early in May in southeastern WASHINGTON, with nearly full-grown larvae damaging potatoes and tomatoes by mid-June in the eastern portion of the State.

POTATO FLEA BEETLE (Epitrix cucumeris) was noted in moderate numbers and causing moderate damage to tomatoes in Presque Isle, Aroostook County, MAINE, in early June. Heavy populations of this chrysomelid caused heavy damage to tomatoes and other crops in Androscoggin and Sagadahoc Counties at this time, while moderate numbers caused light to moderate injury to tomatoes in Cumberland County during the same period. Light populations and light damage to tomatoes were reported in Orono, Penobscot County, Maine, during late June. Very small numbers of potato flea beetle summer-generation adults were reported from 3 potato fields in Presque Isle during early August. Potato flea beetle was very active and damaging to tomatoes in VERMONT during the 1963 season, and adults appeared in potato fields in Kingston, Washington County, RHODE ISLAND, in late May. The pest was heavy on potato in the Newport area of Newport County, Rhode Island, in early June, and scattered infestations were reported on potato, tomato and other crops in the State during the same month. First potato flea beetle adults of the season in DELAWARE were noted feeding on young potato plants in Kent County on April 29, and by May 13 this pest was very numerous on potatoes and tomatoes in most areas of the State. Adults were also abundant in many fields of potatoes during early July in New Castle and Kent Counties. Larval injury to potato tubers was considerably more serious in 1963 than in 1962 in these Delaware counties. Potato flea beetle was light on potatoes in VIRGINIA during June, but did cause some damage to fall potatoes in August. Infestations were sporadic in PENNSYLVANIA during 1963.

Potato flea beetle caused extensive damage to potatoes in areas of OHIO where the crop was not adequately treated during the 1963 season. In WISCONSIN, adults began appearing on potatoes the second week of June, with some damage evident in late July. Potato flea beetle was abundant throughout much of MONTANA during the 1963 season, with many tons of potatoes going into storage damaged by larvae. This situation was worsened by a fungus which gained entrance to tubers through injured areas, resulting in deep, black spots which made the potatoes unsaleable. In NORTH DAKOTA, populations of potato flea beetle were generally low to moderate, with abundant numbers of adults being noted in isolated sections of the northeast area later in the season.

TUBER FLEA BEETLE (Epitrix tuberis) populations were low for the fifth consecutive year in eastern WASHINGTON, and caused only trace amounts of damage to potatoes in all growing areas of COLORADO during 1963. The incidence of this pest in OREGON in 1963 was the lowest in years; its complete absence in some areas being unexplainable. WESTERN POTATO FLEA BEETLE (Epitrix subcrinita) numbers and/or injury were approximately normal in UTAH during the season, but TOBACCO FLEA BEETLE (Epitrix hirtipennis) caused local problems on potatoes in Zavala County, TEXAS. An unusually heavy population of STRIPED FLEA BEETLE (Phyllotreta striolata) occurred on young peppers in Sussex County, DELAWARE, during early June, causing rather heavy feeding injury.

Unspecified FLEA BEETLES were moderate in numbers on potatoes in NEW JERSEY during 1963; Epitrix spp. were heavy on unprotected potatoes, tomatoes and eggplants at numerous locations over MARYLAND; and light populations of Epitrix sp. occurred in early potato fields in Buffalo, Red Willow and Webster Counties, NEBRASKA, during May. In CALIFORNIA, Hemiglyptus basalis and Epitrix sp. caused some damage to tomatoes and other plantings. SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata howardi) caused foliar damage to various crops, particularly potatoes, in Zavala County, TEXAS, and a TORTOISE BEETLE (Gratiana pallidula) damaged eggplants in the same area.

PEPPER WEEVIL (Anthonomus eugenii) ranged from trace to light on pepper plantings in the Irvine area of Orange County, CALIFORNIA, but DARKLING BEETLES (Blapstinus spp. and Metoponium spp.) were a problem locally on tomatoes and other seedling crops in the same State.

SOUTHERN POTATO WIREWORM (Conoderus falli) caused serious damage to tomatoes in SOUTH CAROLINA, which was the first known instance in the State of this pest feeding on stalks of this host. A WIREWORM survey in the State indicated that damage to potatoes by these pests in the spring of 1963 was approximately twice that of 1962, even though lower numbers of wireworms were present in 1963. It is possible that drought conditions during May and June resulted in more feeding on potato tubers. WIREWORMS (Ctenicera spp.) were found only in scattered locations in potato fields in ALASKA during 1963.

TOMATO FRUITWORM (Heliothis zea) caused some damage to late tomatoes on the Eastern Shore of VIRGINIA during the 1963 season, and infestations ranged light to moderate on the same host in GEORGIA, with most infestations being light. Tomato fruitworm was not damaging to tomatoes grown out-of-doors in SOUTH CAROLINA, as of October 15, but is apparently becoming an increasing problem on this crop in greenhouses. Tomato fruitworm and TOBACCO BUDWORM (Heliothis virescens) were found on tomatoes in the Rio Grande Valley in TEXAS. Tomato fruitworm was of minor importance on tomatoes and chili in NEW MEXICO and caused a light loss of 0-2 percent on tomatoes in COLORADO. Loss was approximately 5 percent on tomatoes in southeastern Colorado, where a late fall, without frost, provided favorable conditions for high tomato yields but also increased the possibility of damage due to this species. Populations were below normal in UTAH. Tomato fruitworm infested tomatoes in CALIFORNIA, where the population buildup was not as severe as in previous years but did persist to the end of the year. STALK BORER (Papaipema nebris) was quite common on tomatoes over PENNSYLVANIA during the 1963 season.

CABBAGE LOOPER (Trichoplusia ni) was noticeable on tomatoes in DELAWARE by mid-August, particularly in areas of Kent County. Cabbage looper was a greater problem on the Eastern Shore of VIRGINIA in 1963 than in any year since 1959, damaging trellised tomatoes in early July and fall potatoes in early September. Late tomatoes were also damaged in the area. In FLORIDA, the pest was no particular problem on tomatoes during 1963, but when present was difficult to control. Cabbage looper was a problem on chili peppers in NEW MEXICO this past season.

BLACK CUTWORM (Agrotis ipsilon) and VARIEGATED CUTWORM (Peridroma saucia) injured several plantings of tomatoes, potatoes and other crops over MARYLAND during 1963. Black cutworm was especially abundant in VIRGINIA this season, with as high as 25 percent of potato tubers injured in some localities. The pest caused an estimated loss of 15 percent in 4 or 5 potato fields in Weld County, COLORADO. In CALIFORNIA, black cutworm populations were heavy in potatoes in Kern County. SOUTHERN ARMYWORM (Prodenia eridania) was sporadically troublesome on tomatoes in some fields in FLORIDA, but was not of great concern in the overall picture. In the Bradenton area of Manatee County, BEET ARMYWORM (Spodoptera exigua) was a pest on bell peppers for the first time.

POTATO TUBERWORM (Gnorimoschema operculella) was found infesting potatovines in Monroe County, MICHIGAN, in July. By harvest (mid-September), an area 7 miles long by 6 miles wide was known to be infested. Good commercial control with insecticides was obtained by several growers in the area. This was the first record of potato tuberworm in Michigan since a collection made in Bay County in 1932. Potato tuberworm infestations were light on potatovines in Lucas County, OHIO, in 1963, and larvae of the species fed as leaf miners on eggplant in Harris County, TEXAS. Potato tuberworm was a problem on potatoes for the first time in a long time at Hastings, St. Johns County, FLORIDA. Injury was common and averaged 2-3 percent with some growers having approximately 15 percent damage. These dealers practiced little control.

TOMATO PINWORM (Keiferia lycopersicella) populations were variable in tomato plantings in San Diego, Fresno and Imperial Counties, CALIFORNIA, this past season.

The greatest loss from EUROPEAN CORN BORER (Ostrinia nubilalis) in ALABAMA during the 1963 season was to 4,000 acres of pimento peppers in Marshall, De Kalb and Blount Counties, where considerable loss was caused by larvae entering fruit. Infestations of European corn borer in most sweet peppers in DELAWARE were generally under excellent control, with pod infestations in a few untreated fields averaging between 10 and 20 percent during the last half of September. First egg masses were found on potatoes in Kent County on May 20 and first-generation larvae were full grown by July 11. Largest European corn borer adult flights in Delaware occurred in late July and August, remaining high through mid-September. European corn borer populations in potatoes were very low in NEW JERSEY during the 1963 season.

TOMATO HORNWORM (Protoparce quinquemaculata) was light to medium on tomatoes in CALIFORNIA, with many spotted infestations occurring from Santa Barbara County northward. Tomato hornworm numbers and/or injury were approximately normal in UTAH during the 1963 season. The pest caused losses of 0-2 percent to tomatoes in COLORADO, with loss in the southeastern area of the State being less than one percent. Adults of tomato hornworm began appearing in Dane County, WISCONSIN, light traps on June 26 and continued until August 3. The second-generation flight commenced August 20 and continued to October 19, with unusually large flights occurring in Dodge County. Observations of first-generation larvae feeding were noted as light in most areas of Wisconsin, although localized heavy infestations occurred in Sauk County. Tomato hornworm caused the usual amount of damage to tomato foliage over TEXAS during the season, but no specimens were observed or reported in RHODE ISLAND.

APHIDS on potatoes were of some concern in a few States during the 1963 season. In general, BUCKTHORN APHID (Aphis nasturtii), POTATO APHID (Macrosiphum euphorbiae), GREEN PEACH APHID (Myzus persicae) and FOXGLOVE APHID (Acyrthosiphon solani) were heavier on potatoes in MAINE than during the 1962 and 1961 seasons. Spring migrations of buckthorn aphid and potato aphid began about June 5 and indications were that foxglove aphid began moving about on or soon after June 7. Spring migrants of green peach aphid apparently had not matured by June 11, but were migrating by June 22. By June 28, overall aphid populations on potatoes in Maine were 4 times the 1962 level and twice the 1961 level for the same date.

Buckthorn aphid was the most abundant species at that time. On untreated foliage, appreciable increases in numbers of infested plants were recorded in early July. Peak aphid populations were reached in early August and numbers held steady until mid-August, than decreased steadily because of predation and fungus diseases. At the seasonal peak in Maine, overall aphid numbers were about 3.5 times as large as in 1962, but only one-seventh as large as in 1961. In order of abundance, the species were buckthorn aphid, potato aphid, green peach aphid and foxglove aphid. The first two were the predominant species in Maine until after the seasonal peak. Green peach aphid was generally scarce on potatoes in the State during the 1963 season, while foxglove aphid was not present in more than trace infestations at any time.

Infestations of potato aphid and green peach aphid were not great on potatoes in RHODE ISLAND, but did accentuate dry-weather damage in commercial potato fields during July in Kingston, Richmond and Slocum in Washington County. These same 2 aphids were much less numerous in NEW JERSEY than in 1962. Potato aphid was first noted on potatoes and tomatoes in New Castle and Kent Counties, DELAWARE, during the week of May 21, but populations, generally, were light on these crops the remainder of the growing season. Green peach aphid was heavier than usual on spring potatoes in VIRGINIA, and was abundant on potatoes and other crops in OHIO during the season. Populations of green peach aphid ranged moderate to heavy on early potatoes in Weld County, COLORADO; moderate popula- of the pest developed on late potatoes. Potato aphid was present in trace numbers on potatoes in the San Luis Valley of Colorado, but the aphid was not an economic problem on commercial plantings. Potato aphid was below average in numbers or importance in UTAH, and light in the Tulelake area of Siskiyou County, CALIFORNIA. Green peach aphid infested many vegetable crops in California. Green peach aphid was abnormally scarce in eastern WASHINGTON during May of 1963, but increased on crops during June with controls required during late June and July on potatoes. In ALASKA, aphids on potatoes were low during the 1963 season.

Green peach aphid was present on peppers in New Castle County, DELAWARE, by mid-June and began to increase on this crop during late July. Some very heavy infestations occurred in New Castle County during late August and September. The pest was very heavy on fall peppers in VIRGINIA; was sufficiently numerous on potato plantings in the Homestead area of Dade County, FLORIDA, to warrant insecticidal applications; and was abundant on peppers, eggplant, tomatoes and other crops in OHIO. Populations of green peach aphid on peppers and some other crops in MICHIGAN were higher than usual during August and September.

A ROOT APHID (Rhopalosiphum rufiabdominalis) populations were light on pepper roots in Ventura County, CALIFORNIA. An APHID (Smynthurodes betae) was collected for the first time in NORTH CAROLINA during 1963, being taken on tomatoes in Madison County during June. In Orono, Penobscot County, MAINE, heavy infestations of undetermined aphids caused heavy damage to tomatoes and peppers late in July.

SOUTHERN GREEN STINK BUG (Nezara viridula) and BROWN STINK BUG (Euschistus servus) were light on tomatoes in GEORGIA during the season, and unspecified STINK BUGS were a problem locally on tomato plantings in several locations over CALIFORNIA.

LYGUS BUGS (Lygus hersperus and L. elisus) began damaging potatoes and other crops by late June in eastern WASHINGTON and continued to be a problem for the remainder of the 1963 season. In MONTANA, PLANT BUGS caused some trouble on potatoes during late August in Flathead County.

POTATO LEAFHOPPER (Empoasca fabae) was a problem on potatoes in NEW JERSEY, with one field of potatoes in Cumberland County having been seriously damaged. The pest was rather abundant on some potatoes in DELAWARE by mid-June, and was numerous on potatoes and tomatoes throughout most of the State during July and part of August. Potato leafhopper was considerably above normal in *MARYLAND* during the 1963 season and caused extensive damage to potatoes, peppers and other crops in most sections of the State. Some buildup was noted during August in *RHODE ISLAND* and it was sporadic in *PENNSYLVANIA*. Potato leafhopper was the most important insect attacking vegetable crops in *OHIO* during 1963, causing serious damage to potatoes, peppers and eggplant and being extremely heavy on unsprayed plants. The species also caused heavy feeding damage to untreated potatoes in *WISCONSIN* during the season, with "hopperburn" on home garden potatoes again evident in late summer. This was also true in *MISSOURI*. Potato leafhopper was present in *MICHIGAN*, but caused no serious problems, and populations were generally low to moderate in *NORTH DAKOTA*. Potato leafhopper caused trace amounts of damage to potatoes in all growing areas of *COLORADO*.

BEET LEAFHOPPER (*Circulifer tenellus*) populations were high in most tomato-growing areas of *NEW MEXICO* during 1963, with curly top virus an important factor in reducing yields in Valencia, San Juan, Rio Arriba, Dona Ana and Luna Counties. In the western area of *COLORADO*, losses to tomatoes ranged 6-15 percent, due primarily to beet leafhopper and resulting curly top. Some purple-top in tomatoes, transmitted by SIX-SPOTTED LEAFHOPPER (*Macrosteles fascifrons*), was reported from the Red River Valley of *MINNESOTA*.

Unspecified LEAFHOPPERS were very heavy on several plantings of potatoes on the Eastern Shore of *VIRGINIA* during late August and several species caused some damage to potatoes in *TEXAS*. Leafhopper populations were low on potatoes in *ALASKA* during the 1963 season.

POTATO PSYLLID (*Paratrioza cockerelli*) populations in *NEVADA* were the heaviest in several years, being heavy in Clark, Esmeralda and Nye Counties in April and heavy in Churchill and Mineral Counties in May. Populations were markedly smaller during 1963 in *WYOMING* than those in 1962; first specimens were collected on matrimony-vine in Albany County on June 18 and the first on potatoes July 2 in Goshen County. Damage was very slight on late-planted potatoes in Goshen County. In *COLORADO*, potato psyllid populations on native host plants early in the spring of 1963 were present in numbers that in most years would have been a threat to potatoes; however, the weather became hot and dry and no damaging populations developed on potatoes in Weld County. In Saguache, Rio Grande, Alamosa, Conejos, Costilla and Montrose Counties, Colorado, potato psyllid was found in light numbers on potatoes early in the growing season and some controls were applied; losses were less than 1 percent. This psyllid was present on tomatoes late in September in Weld and Larimer Counties, but no damage resulted. Potato psyllid was light in potato-growing areas of Kern County, *CALIFORNIA*, and in the panhandle area of *NEBRASKA*, and the pest was below average during 1963 in *UTAH*.

A WHITEFLY (*Aleyrodes spiraeoides*) was abundant and damaging on potatoes in Grant County, *WASHINGTON*, in late August. Unspecified whiteflies were present on eggplant and other crops in Coachella, Riverside County, *CALIFORNIA*.

PEPPER MAGGOT (*Zonosemata electa*) was a serious problem in *NEW JERSEY* during the 1963 season, and was a problem on commercial peppers in Warren, Vance and and Wake Counties, *NORTH CAROLINA*, during early August.

Heavy numbers of a LEAF MINER FLY (*Liriomyza munda*) occurred on a wide variety of crops in *TEXAS*, including tomatoes, and infestations in the winter garden area of Dimmit and Zavala Counties were sufficiently significant to warrant controls. In *FLORIDA*, another LEAF MINER FLY (*L. archboldi*) caused complete loss of leaf function on unsprayed tomatoes in the Brandenton area, Manatee County. Unspecified leaf miner flies on tomatoes in the Ft. Pierce-Okeechobee area were relatively light compared with 1962, and somewhat the same situation prevailed in the Homestead area where these pests were prevalent but not serious An unspecified LEAF MINER was a serious threat to greenhouse tomatoes and staked tomatoes in *SOUTH CAROLINA* during the 1963 season.

VINEGAR FLIES (Drosophila spp.) built up to high numbers in NEW JERSEY after September 1 as a result of heavy rains and cloudy weather at that time. These flies were not a serious problem around tomato canneries in MARYLAND until relatively late in the season. D. melanogaster was light on tomatoes during 1963 in NEW YORK.

Several species of THRIPS were destructive to peppers and other crops during the summer months in MARYLAND, but caused only trace amounts of damage to potatoes in all growing areas of COLORADO. WESTERN FLOWER THRIPS (Frankliniella occidentalis) and ONION THRIPS (Thrips tabaci) were variable on tomatoes, peppers and other crops in TEXAS, requiring controls in several areas. Western flower thrips was a problem on peppers and tomatoes in a few CALIFORNIA locations.

FIELD CRICKETS (Gryllus spp.) became abundant in gardens in many areas of NORTH DAKOTA during the 1963 season, and caused considerable damage to tomato fruits in the Fargo area of Cass County.

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) caused very extensive damage to tomato and eggplant in NEW JERSEY. The pest migrated from clovers and other spring hosts to potatoes and other crops in central WASHINGTON, where unseasonably hot weather during August and September was conducive to rapid buildup and damage. Unspecified SPIDER MITES were a problem on tomatoes and potatoes in local areas in most sections of TEXAS during the season.

TOMATO RUSSET MITE (Aculus lycopersici) populations on tomatoes were light in a few locations over CALIFORNIA, and numbers were below average during the season in UTAH.

GARDEN SYMPHYLAN (Scutigerella immaculata) was very abundant in some instances in PENNSYLVANIA, causing damage to peppers and tomatoes, and caused 60-75 percent loss to one field of tomatoes in Weld County, COLORADO. CENTIPEDES were a problem locally on tomatoes and other crops in Santa Cruz County, CALIFORNIA, during the 1963 season. MILLIPEDS damaged home garden potatoes in 2 areas of WASHINGTON; Polydesmus inconstans in Columbia County and Diploiulus latistriatus in Kitsap County. In ALASKA, potatoes were severely damged by SLUGS at English Bay.

CRUCIFER INSECTS

Highlights:

IMPORTED CABBAGEWORM was a problem on cabbage and cauliflower in areas of New Mexico; destroyed all unprotected cabbage in northeastern Kansas; and severely injured home plantings of broccoli, cabbage and kale in all sections of Maryland during the 1963 season. CABBAGE LOOPER caused considerable damage to crucifers in all sections of Maryland, especially late in the season, and was a greater problem on the Eastern Shore of Virginia during August than in any year since 1959. Cabbage looper was apparently more difficult to control during 1963 over a large portion of Florida, especially on crucifers. The species was also a problem on cabbage and cauliflower in areas of New Mexico. STRIPED FLEA BEETLE was an important pest of cole crops in Ohio, and CABBAGE APHID severely damaged many cabbage plantings in southeastern Wisconsin. CABBAGE MAGGOT was more of a problem in the mountain counties of North Carolina than in 1962, and caused considerable damage in Illinois, due to resistance to certain insecticides. The pest also became resistant to chlorinated hydrocarbons for the first time in the Skagit Valley of Washington. Cabbage maggot caused widespread damage to cabbage in early June in Wisconsin, and was found for the first time in Ravalli and Missoula Counties, Montana, during 1963. TURNIP MAGGOT infested crucifers in all areas of Alaska and continued to be the most consistent serious problem there. POPLAR PETIOLE GALL APHID heavily damaged cabbage in the Rio Grande Valley of Texas.

IMPORTED CABBAGEWORM (Pieris rapae) was medium on cole crops in several areas of CALIFORNIA during the 1963 season, and was a problem on cabbage and cauliflower in Bernalillo and Sandoval Counties, NEW MEXICO. The pest was approximately normal in numbers and/or injury in UTAH, but numbers were economic on cabbage in Pueblo County, COLORADO. Imported cabbageworm adults appeared in two cycles of moth flight in KANSAS, resulting in destruction of all unprotected cabbage in the northeast area of the State. Imported cabbageworm was destructive on all cole crops in the Corvallis area of Ravalli County, MONTANA, and was abundant in gardens over NORTH DAKOTA during the 1963 season. Larvae of this pest were again damaging to cole crops in home gardens in WISCONSIN, but injury in commercial plantings was minimal. In NORTH CAROLINA, imported cabbageworm was a pest of crucifers, but much easier to control than cabbage looper (Trichoplusia ni).

Imported cabbageworm severely injured home plantings of broccoli, cabbage and kale in all sections of MARYLAND during 1963. First adults were noted throughout DELAWARE on April 3 and by May 20, larvae were fairly common on cabbage in New Castle and Kent Counties. Most injury in the State occurred on small cabbage fields during June and July. Larvae of imported cabbageworm first appeared in western NEW YORK about June 1, but populations were normal to less than normal throughout the State during the 1963 season. In VERMONT, the pest attacked crucifers in home gardens. Light numbers of imported cabbageworm adults were noted on cole crops in the Yarmouth-Cape Elizabeth area of Cumberland County, MAINE, early in June. Light to moderate numbers and damage were reported on cabbage from Androscoggin and Sagadahoc Counties in late July and early August, and light numbers and damage on broccoli from the Monmouth area of Kennebec County and the Orono area of Penobscot County in early August. Light populations of imported cabbageworm caused moderate damage to cabbage in the Bangor area, Penobscot County, during mid-August and moderate numbers and damage were observed on rutabaga in Dixfield, Oxford County, at the same time.

CABBAGE LOOPER (Trichoplusia ni) was present in light numbers in Orono, Penobscot County, MAINE, and caused light damage to that crop in early August; and was a pest of crucifers in home gardens in VERMONT, during the season. Cabbage looper was not abundant in western NEW YORK at any time during 1963, but was normal or slightly above late in the season on Long Island. The pest was not quite so abundant in PENNSYLVANIA as in 1962. Cabbage looper was not noticeable on cabbage in DELAWARE until early in August, particularly in areas of Kent County. By late August and September, larvae were generally very common on most cole crops throughout the State. Cabbage looper caused considerable damage to cabbage, broccoli and other crucifers in all sections of MARYLAND, especially late in the season. This pest was a greater problem during August on the Eastern Shore of VIRGINIA than in any year since 1959. Broccoli in the area suffered the most damage, but other crops, including cucurbits, were also damaged. Cabbage looper was the usual severe problem on both commercial and garden cabbage in all areas of NORTH CAROLINA during the 1963 season, but infestations were light to moderate on cabbage and collards in GEORGIA.

Cabbage looper was apparently more difficult to control during 1963 in FLORIDA, especially on crucifers, from Homestead, Dade County, to the northern portion of that State. This was apparently due to population pressure and reduction of effectiveness of insecticides. During early fall, populations in the Sanford area of Seminole County were high; because chemicals failed to reduce these populations, considerable damage occurred to cabbage fields. Later, chemicals and cold weather, including exceptionally heavy rains, reduced cabbage looper numbers to the point they were no longer an economic factor in cabbage production. Cabbage looper was serious early in the season at Zellwood, Orange County, Florida, and was very injurious at Belle Glade, Palm Beach County, in April and May on plants not sprayed at least once a week. During the fall, however, cabbage looper was not as serious in the Everglades, ranging light to moderate. In the Hastings and Gainesville areas of Florida, economic numbers of cabbage looper were delayed, but when they did appear, much cabbage had been harvested. Earlier in the season, infestations were lighter than usual. Cabbage looper caused considerable injury to cabbage in some areas of LOUISIANA during the 1963 season, with counts of 5-8 per plant not uncommon in early September.

Cabbage looper was a problem on cabbage and cauliflower in Bernalillo and Sandoval Counties, NEW MEXICO, and populations were moderate to heavy in some cabbage fields in Adams County, COLORADO, but were controlled. In NORTH DAKOTA, cabbage looper was abundant in gardens over the State during the season.

BLACK CUTWORM (Agrotis ipsilon) and GRANULATE CUTWORM (Feltia subterranea) were serious on vegetable crops, particularly cabbage, during the spring and fall season in the Belle Glade area of Palm Beach County, FLORIDA, with controls being unsatisfactory in some instances. In the same area, Prodenia spp., mostly SOUTHERN ARMYWORM (P. eridania), were very heavy during late spring, with most damage occurring to weeds or abandoned crop material; however, some damage occurred to crucifers, particularly in border rows.

Low populations of SALT-MARSH CATERPILLAR (Estigmene acrea) caused slight damage to broccoli in Orono, Penobscot County, MAINE, during early to mid-August. DIAMONDBACK MOTH (Plutella maculipennis) was an important pest of crucifers in NORTH CAROLINA during the 1963 season, but was much easier to control than cabbage looper. On the Eastern Shore of VIRGINIA, diamondback moth was rather numerous on localized plantings of greens in early July. GARDEN WEBWORM (Loxostege similalis) populations ranged moderate to heavy in some fields of cabbage in Adams County, COLORADO, but were controlled.

POTATO FLEA BEETLE (Epitrix cucumeris) infestations were scattered on broccoli and turnip during late June in RHODE ISLAND, and STRIPED FLEA BEETLE (Phyllotreta striolata) was an important pest of cole crops in OHIO during the 1963 season. Adults and injury of another FLEA BEETLE (P. cruciferae) were first noted on young cabbage in DELAWARE during mid-April. By mid-May, this species was causing considerable feeding injury to cabbage, horseradish and turnips in various areas. Populations were also rather common on horseradish in July and on late cabbage during August in some areas of Delaware. In MARYLAND, Phyllotreta spp. were again abundant on several cruciferous crops during the season.

SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata howardi) was heavy on mustard and turnip greens in southeast GEORGIA during the 1963 season, and RED TURNIP BEETLE (Entomoscelis americana) severely damaged crucifers in gardens near Kenny Lake in the Copper River Valley of ALASKA.

CABBAGE CURCULIO (Ceutorhynchus rapae) damaged 6 fields of cabbage in Northampton County, VIRGINIA, during June, and VEGETABLE WEEVIL (Listroderes constirostris obliquus) caused mild concern to turnip growers in Trinity County, TEXAS, during the past season. In CALIFORNIA, a WEEVIL (Brachyrhinus cribricollis) was heavy on broccoli plantings in Santa Maria, Santa Barbara County. CABBAGE SEEDPOD WEEVIL (Ceutorhynchus assimilis) was unusually abundant in northwestern WASHINGTON by late April. This species usually appears in the State the first week of April, regardless of the weather.

CABBAGE APHID (Brevicoryne brassicae) populations persisted on cole crops all year in the various growing areas of CALIFORNIA as crops were planted. It began appearing in large numbers on brussel sprouts and broccoli during late July in Marion, Clackamas and Multnomah Counties, OREGON, but was approximately normal in numbers and/or injury in UTAH this season. Cabbage aphid colonies commenced forming early (the first week of June) in WISCONSIN and caused severe damage to many cabbage plantings in the southeast area. These populations collapsed the first week of July. In FLORIDA, cabbage aphid populations were heavy during April and May on inadequately treated cabbage in the Everglades. In the northern area of Florida, the aphid was about normal, being kept under control by appropriate insecticides. Cabbage aphid infestations on cabbage and collards were unusually light during the 1963 growing season in GEORGIA. Cabbage aphid appeared early in NEW YORK and was very abundant throughout the season in the western part of the State and average in the southeast and on Long Island. In RHODE ISLAND, the pest infested broccoli in Kingston, Washington County, during August, and in Riverside, Providence County, during September.

First adults and nymphs of GREEN PEACH APHID (Myzus persicae) were active on cabbage in New Castle County, DELAWARE, on April 29 and the pest was present on turnips and horseradish by mid-June. This aphid was abundant on radishes, turnips and other crops in OHIO during 1963, and in TEXAS, ranged moderate to heavy on cabbage and turnips in the winter garden area of Dimmit and Zavala Counties, the Rio Grande Valley and gulf coast areas. Also in Texas, POPLAR PETIOLE GALL APHID (Pemphigus populitransversus) heavily damaged cabbage in the Rio Grande Valley, with about 75 percent of the fields in the southern half of the valley being heavily infested. TURNIP APHID (Hyadaphis pseudobrassicae) infestations were heavy and very common on turnips in OHIO. Unspecified cabbage aphids were more of a problem in NEW JERSEY during 1963 than in 1962.

CABBAGE MAGGOT (Hylemya brassicae) populations were moderate in the Scarboro area of Cumberland County, MAINE, in early June, causing heavy damage to cauliflower and radish, and heavy egg deposition was found on cabbage and cauliflower in the Cape Elizabeth area of the same county. Light damage to these same crops was also reported from Yarmouth at about the same time. Light infestations of cabbage maggot were observed on cabbage in Jonesboro, Washington County, in late June and on radish in Orono, Penobscot County, in mid-July. Heavy populations and damage to late broccoli occurred in Monmouth, Kennebec County, Maine, with all plants dead or dying by September 5. Cabbage maggot infested radish in Warwick, Kent County, and in Kingston, Washington County, RHODE ISLAND, in late July. Adult populations of this pest were high and egg laying very heavy by May 10 in the Bridgeport area of CONNECTICUT, but infestations were generally moderate in NEW YORK during 1963. Cabbage maggot was more of a problem on cabbage in the mountain counties of NORTH CAROLINA than in 1962.

In ILLINOIS, most vegetable and truck crop insects were relatively light during 1963 and kept well under control. The one exception was cabbage maggot, which caused considerabe damage and was difficult to control due to resistance to certain insecticides. The first generation of cabbage maggot in WISCONSIN caused widespread damage to cabbage during the first week of June. The second generation was underway in the State by the first week of July and caused some damage, although it was not as extensive as that caused by the first generation. Cabbage maggot was observed for the first time in Ravalli and Missoula Counties, MONTANA, during 1963, and was locally a pest of cole crops in Santa Cruz and Masonville, Santa Cruz County, CALIFORNIA, during the season. Light damage by this pest occurred to cabbage, cauliflower, turnip and rutabaga in Multnomah County, OREGON, with egg laying being noted May 11. Cabbage maggot became highly resistant to chlorinated hydrocarbon treatments for the first time in the Skagit Valley of WASHINGTON, with cauliflower production being cut in half. Resistance had previously been noted in the central portion of western Washington.

TURNIP MAGGOT (Hylemya floralis) infested crucifers in all areas of ALASKA, continuing to be the most consistent serious problem. Pupation occurred in cabbage heads and the pest was active in turnips until the middle of October.

HARLEQUIN BUG (Murgantia histrionica) and other STINK BUGS were more of a problem in home gardens on the Eastern Shore of VIRGINIA during 1963 than for the past several years.

CENTIPEDES were a local problem on cauliflower and other crops in Santa Cruz County, CALIFORNIA, and SLUGS severely damaged crucifers in southeastern port areas of ALASKA during the 1963 season there.

BEAN, PEA AND OTHER LEGUME INSECTS

Highlights:

MEXICAN BEAN BEETLE was damaging to beans in areas of New Mexico, more injurious statewide in Michigan, the most important pest of commercial and garden beans in North Carolina and above normal on beans on the Eastern Shore of Maryland during 1963. PEA WEEVIL was unusually heavy in Marion and Clackamas County pea fields in Oregon. Various CUTWORMS were serious on vegetables in several States, particularly in Florida. PEA APHID was unusually low in pea-growing areas of Oregon, but did necessitate treatment of 10,000 acres of peas in Lewis County, Idaho. POTATO LEAFHOPPER populations were substantial on commercial lima beans in Wisconsin, and seriously damaged beans and other crops in Ohio; numbers were considerably above normal in Maryland, causing extensive damage to beans and other crops in most sections of the State. LYGUS BUGS damaged many crops in California and required considerable control. THRIPS were also of some concern, with damage reported in California, Michigan and Maryland.

MEXICAN BEAN BEETLE (Epilachna varivestis) completely defoliated garden plantings of pinto and pole beans at Belen and Los Lunas, Valencia County, NEW MEXICO, with lighter infestations being reported from Bernalillo County. Heavy populations of the pest skeletonized foliage in Estancia Valley bean fields during August. Mexican bean beetle caused light to moderate damage to garden beans in most areas of ARIZONA in 1963, with largest populations being found in Graham and Greenlee Counties. The beetle was more abundant and/or more damaging than normal in UTAH, but only trace numbers (0-1 per 10 plants) were found on garden beans in nine COLORADO counties. Mexican bean beetle was not a serious problem in WYOMING during 1963, Platte County being the only area in the State where the pest was found. No damage could be found in bean fields and few, if any, controls were applied. In general, populations were much lower in Wyoming than during 1962. Mexican bean beetle caused almost complete destruction of fall-planted garden beans in Doniphan County, KANSAS, but populations were very low in the Panhandle of NEBRASKA. Mexican bean beetle caused more injury statewide in MICHIGAN during 1963 than during recent years.

Mexican bean beetle was general on pole beans at Quincy, Gadsden County, FLORIDA, and ranged light to moderate on pole, snap and lima beans in GEORGIA. Damage by this pest was normal throughout SOUTH CAROLINA during the 1963 season, and damaging numbers did not appear until late in the season in TENNESSEE. Mexican bean beetle was the most important pest damaging commercial and garden beans throughout NORTH CAROLINA, feeding beginning in May and continuing throughout the season. This species lightly infested snap and lima beans during June on the Eastern Shore of VIRGINIA. The pest was more numerous in early July than in recent years, but was easily controlled. Mexican bean beetle was above normal on snap and lima beans on the Eastern Shore of MARYLAND in 1963 and damage to unprotected plants was general, but populations on beans in central and western sections of the State were somewhat below normal.

Scattered populations of Mexican bean beetle occurrred on snap and lima beans during late June and early July in DELAWARE, with rather heavy feeding injury noticeable in some areas of Sussex and Kent Counties. Populations of the pest were low in NEW JERSEY and light in NEW YORK. Eggs were found on vegetables in MASSACHUSETTS on June 20, but none had hatched in the Springfield area at that time. The first adult Mexican bean beetle of the season in RHODE ISLAND was collected June 4 in Washington, Kent County, and the pest was present generally in average abundance during the 1963 season.

BEAN LEAF BEETLE (Cerotoma trifurcata) adults were common and caused light to heavy foliage injury to early and late snap and lima beans in all sections of MARYLAND, but the pest was relatively light and scattered on beans throughout the season in VIRGINIA. Bean leaf beetle caused considerable damage to pole beans early in the 1963 season in SOUTH CAROLINA, and ranged light to moderate on pole, snap and lima beans in GEORGIA. In MISSOURI, bean leaf beetle was reported feeding on truck crops and in gardens during the season. WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata undecimpunctata) was somewhat lighter than in most years in OREGON, with damage to bush beans being reported in Linn County.

COWPEA WEEVIL (Chalcodermus aeneus) was reported to have caused some damage to cowpeas and beans in the Belle Glade area of Palm Beach County, FLORIDA. In one instance, the wrong insecticide had been used, and in another, no control had been applied. PEA LEAF WEEVIL (Sitona lineata) damaged blossoms of pole beans in Linn and Benton Counties, OREGON, during August, and PEA WEEVIL (Bruchus pisorum) was unusually heavy during early June in pea fields of Marion and Clackamas Counties, same State.

GRANULATE CUTWORM (Feltia subterranea) and BLACK CUTWORM (Agrotis ipsilon) were serious on vegetable crops, particularly beans, during the spring and fall seasons in the Belle Glade area of Palm Beach County, FLORIDA, with some growers experiencing unsatisfactory controls. BEET ARMYWORM (Spodoptera exigua) was a problem on black-eyed peas and field peas in the Bradenton area of Manatee County in the same State. In the Belle Glade area, Prodenia spp., mostly SOUTHERN ARMYWORM (P. eridania), were very heavy late in the spring, with most damage occurring to weeds or abandoned crop material; however, some damage occurred to beans and field peas, particularly in border rows. Also in Florida, several fields of pole beans at Quincy, Gadsden County, were heavily infested by a LOOPER (Pseudoplusia includens), and pole beans in the area generally, were attacked by TOMATO FRUITWORM (Heliothis zea).

A larval complex, including CABBAGE LOOPER (Trichoplusia ni), tomato fruitworm and other CUTWORMS, caused considerable damage to fields of pole beans during the spring in the Zellwood area, Orange County, FLORIDA. A combination of poor weather and failure of growers to make sufficiently frequent field inspections allowed populations of these pests to reach destructive proportions before the presence of larvae was suspected. Considerable loss occurred before this situation was controlled. Populations of tomato fruitworm were light to medium locally in CALIFORNIA; however, population buildup was not so severe as in previous years, but the pest did persist to the end of the year. Larvae of LIMA-BEAN VINE BORER (Monoptilota pergratialis) caused heavy injury to lima beans in research plots at Salisbury, Wicomico County, MARYLAND, during the 1963 season.

PEA APHID (Acyrthosiphon pisum) was unusually low during 1963 in the pea-growing areas of OREGON, but was very abundant in pea fields in Lewis County, IDAHO, where approximately 10,000 acres of peas were severely infested and heavily damaged. In UTAH, the species was below normal in abundance and importance on peas during the season. Eggs of pea aphid hatched by April 8 in WISCONSIN and the first winged form was noted in mid-May. Populations fluctuated considerably on peas in Wisconsin, according to the area and stage of development of the crop. Pea aphid ranged light to moderate in southern MISSOURI gardens during the early spring, but these infestations were greatly reduced in two weeks by beneficial insects or chemical controls. Pea aphid populations were light in NEW YORK in 1963. The aphid was first noted on commercial peas in Sussex County, DELAWARE, on May 6, with populations increasing noticeably on this crop throughout the State by the week of May 21. Subsequent insecticidal applications on peas appeared to effectively control this aphid for the remainder of the season.

BEAN APHID (Aphis fabae) was first noted on snap beans in Sussex County, DELAWARE, in mid-May and populations were rather numerous on young lima beans in Kent and Sussex Counties during early July. Some infestations were also observed on late lima beans in the State during August. Various aphids, but mostly bean aphid, appeared on Harvester variety snap beans at Belle Glade, Palm Beach County, FLORIDA, and were troublesome to some growers. Bean aphid numbers and/or injury were approximately normal in UTAH during 1963, and light to medium populations developed on lima and dry beans in Orange, Ventura and Butte Counties, CALIFORNIA. Bean aphid populations reached their highest peak during early August in Umatilla County, OREGON, where lima beans were seriously damaged.

COWPEA APHID (Aphis craccivora) was variable during 1963 on miscellaneous bean and legume crops in FLORIDA, but overall damage to Harvester variety snap beans was moderate in the spring and very low in the fall. An APHID (Smynthurodes betae) was collected in NORTH CAROLINA for the first time during 1963, being taken on beans in Davie County during June.

Substantial populations of POTATO LEAFHOPPER (Empoasca fabae) were present on commercial lima beans in WISCONSIN, although injury was not readily apparent. The pest fed heavily on untreated beans in the State and was common on peas; however, damage was not evident on these crops. Potato leafhopper seriously damaged beans and other crops in OHIO during 1963, with populations on unsprayed plants being extremely heavy. Potato leafhopper numbers were considerably above normal in MARYLAND and caused extensive damage to beans and other crops in most sections of that State during 1963. First potato leafhopper adults of the 1963 season in DELAWARE were noted May 20 on peas in Kent County, and were common on snap and lima beans by mid-June. During July and part of August, potato leafhopper was numerous on beans throughout most of Delaware. The pest was not generally abundant on beans in NEW YORK, but was considered at least normal in limited situations. In VERMONT, beans were damaged by potato leafhopper during the 1963 season.

Unspecified LEAFHOPPERS were very heavy on several plantings of black-eyed peas on the Eastern Shore of VIRGINIA during late August, and GREEN STINK BUG (Acrosternum hilare) was occasionally damaging to beans in home gardens in several areas of the State during late summer.

LYGUS BUGS (Lygus spp.) were numerous and damaging to many crops in CALIFORNIA during the 1963 season and required considerable control. The problem of resistance made this control difficult in some areas. Lima beans and dry beans were among the crops most affected in California. COTTON FLEAHOPPER (Psallus seriatus) populations were widespread on snap beans in Cameron County, TEXAS, during the season.

THRIPS were unusually abundant on many cultivated, as well as native hosts, in CALIFORNIA during the 1963 season, and caused some damage to field beans in Solano County. Unspecified thrips caused 0-1 percent damage to beans in Weld, Adams, Delta and Mesa Counties, COLORADO; and thrips caused considerable injury to navy beans during early July in Saginaw and Shiawassee Counties, MICHIGAN, where late beans under stress from drought suffered the most damage. In MARYLAND, several species of thrips were destructive to beans and other crops during the summer months.

A LEAF MINER FLY (Liriomyza munda) infested a wide variety of crops, including beans, in TEXAS, with infestations in the winter garden area of Dimmit and Zavala Counties being sufficiently significant to warrant controls. Liriomyza spp. were heavy in table legumes in the Belle Glade area of Palm Beach County, FLORIDA, during the spring and were heavier where ineffective controls were used than where no control was applied. Populations were very much lighter in the fall. Unspecified leaf miner flies were heavy in spring field peas at Hastings, Saint Johns County, Florida, and abundant on lower leaves of southern peas at Bradenton, Manatee County, during the same time of year.

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) populations on beans in CALIFORNIA developed light to medium locally in Orange County, were heavy in Butte County, medium in coastal Santa Barbara County, and heavy in San Diego County. The species was late in developing in 1963, and populations were not so severe as in past years in most locations in California. SPIDER MITES (Tetranychus spp.) were numerous and widespread during July and August on beans and other crops in MARYLAND, with home gardens being especially hard hit. Unspecified SPIDER MITES heavily infested beans in home gardens in several VIRGINIA counties in July, and were a problem on beans, peas and other crops in several local areas in most sections of TEXAS.

GARDEN SYMPHYLAN (Scutigerella immaculata) damaged beans in southwestern WASHINGTON during the 1963 season, continuing into late July because of a cool, rainy season.

ASPARAGUS AND ONION INSECTS

Highlights:

ASPARAGUS BEETLES were not a particular problem during 1963. ONION MAGGOT damaged onion for the first time in Multnomah County, Oregon, and caused considerable loss to dry onions and green table onions in northeastern Colorado; the first generation in Wisconsin caused extensive damage to onions during the first week of June. ONION THRIPS was moderate to heavy in all onion-growing areas of Colorado, and caused heavy damage to green onions in Clark County, Nevada.

ASPARAGUS BEETLE (Criocerus asparagi) and SPOTTED ASPARAGUS BEETLE (C. duodecimpunctata) continued prevalent in western MONTANA during the 1963 season, but were below average in numbers and importance in UTAH. Both species appeared in East Greenwich, Kent County, RHODE ISLAND, on May 20, and were noted in normal abundance in Kingston, Washington County, and in Lincoln, Providence County, during the season. Neither species was a particular problem in NEW JERSEY during the 1963 season.

Asparagus beetle was frequently reported in VERMONT during the year, and first adults were found feeding on stalks of asparagus in most areas of DELAWARE by April 15. The pest was generally under good control in Delaware, with feeding injury very light except in one or two fields. Asparagus beetle populations on commercial asparagus in MARYLAND were about normal early in the season and on foliage during the summer. Numbers were heavy in some home gardens on the Eastern Shore of Maryland. Asparagus beetle was locally damaging to asparagus in SOUTH CAROLINA during mid-April, and was light on asparagus in Fresno, Fresno County, CALIFORNIA, during the season.

Spotted asparagus beetle was common on asparagus in the North Platte River Valley, NEBRASKA, in May, and was abundant on the same crop in southern portions of NORTH DAKOTA during the season. Moderate infestations of the beetle were reported in Rumford Point, Oxford County, MAINE, in mid-July, with damage light to that date.

An undetermined desert species of CICADA was light to medium on asparagus plantings in Coachella, Riverside County, CALIFORNIA.

ONION MAGGOT (Hylemya antiqua) heavily infested onions grown from sets in the Seward area of ALASKA. Infestation and damage to onions by this pest occurred for the first time in Multnomah County, OREGON, during 1963, but no damage to onion was reported from other areas of the State. Heavy onion maggot populations were reported in the Corvallis area of Ravalli County, MONTANA, and in other parts of the State as well. The long, wet spring appeared to have created ideal conditions for development of the pest in the State. Infestations of onion maggot were at the lowest level in several years in Lyon and Washoe Counties, NEVADA, but the pest was approximately normal in UTAH. Onion maggot was not a problem on onions in western or southeastern COLORADO, but the pest did cause considerable loss to dry onions as well as green table onions in the northeastern portion of the State. Apparently onion maggot is resistant to the control measures being used in northeastern Colorado. Losses were estimated to be 2-4 percent in the western area, 5-75 percent in the northeast and 1-2 percent in the southern area of the State.

The first generation of onion maggot in WISCONSIN caused widespread damage to onions during the first week of June. The second generation began the first week of July and caused some damage, although not so extensive as that of the first generation. Onion maggot was a serious problem in southern NEW JERSEY during the 1963 season, although it is not usually a problem in that area of the State.

ONION THRIPS (Thrips tabaci) populations were moderate to heavy in all onion-growing areas of COLORADO, ranging 20-100 per plant. Controls were applied in some fields but they did not appear too effective. In UTAH, onion thrips populations and/or injury on onion appeared to be about normal during the 1963 season. Populations and damage to green onions were heavy in Clark County, NEVADA, during March. Infestations on green onions varied light to heavy in Lyon and Washoe Counties from May to August, with treatments necessary in many instances. In CALIFORNIA, infestations of the pest on onion were variable in Orange, Imperial and Riverside Counties.

Onion thrips and WESTERN FLOWER THRIPS (Frankliniella occidentalis) were variable on onions and other crops in TEXAS during 1963, but did require controls in several areas of the State. Unspecified THRIPS were moderately heavy in onion fields near Portales, Roosevelt County, NEW MEXICO; treatments were required and control was good. In MARYLAND, several species of thrips were destructive to asparagus, onions and other crops during the summer months.

BLACK CUTWORM (Agrotis ipsilon) and VARIEGATED CUTWORM (Peridroma saucia) injured several plantings of onions and other crops over MARYLAND during the season, and unspecified CUTWORMS caused medium damage to garlic in Lyon County, NEVADA, during March.

BEET, SUGAR BEET, SPINACH AND CHARD INSECTS

Highlights:

BEET LEAFHOPPER was responsible for considerable reduction in sugar beet yields in two areas of Colorado by transmitting curly top virus, and the virus was again damaging to sugar beets in areas of Wyoming. GREEN PEACH APHID was medium to heavy on spinach in southern vegetable-growing areas of Texas. BEET WEBWORM was sufficiently numerous in areas of Colorado to require controls, and populations were high in Wyoming with controls applied to 80 percent of sugar beet fields. PACIFIC COAST WIREWORM severely damaged sugar beets in Walla Walla County, Washington, during May, and SPINACH LEAF MINER was more severe than usual on sugar beets and spinach in the eastern part of the State.

BEET LEAFHOPPER (Circulifer tenellus) occurred on sugar beets in local areas of San Luis Obispo, Los Angeles and Imperial Counties, CALIFORNIA, during the 1963 season. Populations developed in a normal pattern during the spring and summer, and congregated on Russian-thistle in the fall. An area of approximately 250,000 acres of range and brush lands in California was treated in the fall, with approximately a 98-percent kill of leafhoppers. The pest was below average in numbers and importance in UTAH during the season. Beet leafhopper movement from southern overwintering areas into COLORADO was expected to range light to moderate in 1963, but in two areas of that State, the pest caused considerable reduction in sugar beet yields by the transmission of curly top virus. Evidently a beet leafhopper population overwintered within or near these sugar beet-growing areas of Colorado and caused the resulting loss. In western Colorado, in Mesa, Delta and Montrose

Counties, this species caused 7-9 percent loss and in the southern counties of Baca and Prowers, losses were 5-10 percent. Curly top again damaged sugar beets in Big Horn, Hot Springs and Washakie Counties, WYOMING. A reduction in the beet leafhopper population was noticed in 1963, possibly due to a control program of spraying host weeds which included about 4,000 acres of wasteland bordering irrigated areas in Washakie County. The first beet leafhopper specimens for 1963 in Wyoming were recovered March 19 and the first infected plants were found in early June. Curly top symptoms in spinach were minimal in the winter garden area of Dimmit and Zavala Counties, TEXAS, and in the Rio Grande Valley area of the State.

Unspecified LEAFHOPPERS were a problem on sugar beets and other crops at several locations over CALIFORNIA during 1963.

GREEN PEACH APHID (Myzus persicae) was potentially severe on spinach early in April on the Eastern Shore of VIRGINIA, but control was exerted by a fungus. Infestations of the aphid were moderate to heavy on spinach in the winter garden area of Dimmit and Zavala Counties, the Rio Grande Valley and gulf coast area of TEXAS, and abundant on spinach and other crops in OHIO. Green peach aphid was abnormally scarce in eastern WASHINGTON during May, but increased on crops during June, with controls being required on sugar beets in late June and July.

Large populations of BEAN APHID (Aphis fabae) were recorded on sugar beets in the Walla Walla area of WASHINGTON during late September. SUGAR-BEET ROOT APHID (Pemphigus betae) was more abundant and more damaging than normal in UTAH during the 1963 season, and APPLE GRAIN APHID (Rhopalosiphum fitchii) was a problem on sugar beets in the Cambria area of San Luis Obispo County, CALIFORNIA.

LYGUS BUGS (Lygus hesperus and L. elisus) began damaging sugar beets and other crops in eastern WASHINGTON by late June and continued to be a problem for the remainder of the season.

BEET WEBWORM (Loxostege sticticalis) was medium on sugar beets in Coachella, Riverside County, CALIFORNIA, but was below average in numbers or importance in UTAH during the 1963 season. Beet webworm was present on sugar beets in sufficient numbers in Larimer, Weld, Morgan, Logan and Sedgwick Counties, COLORADO, to require the application of controls. A second generation of the pest occurred in some fields this year. Losses were light in Colorado, except in fields where the first generation occurred on late planted beets prior to time of thinning. Beet webworm populations were higher in WYOMING than in 1962, with about 80 percent of sugar beet fields requiring control efforts. Very little damge was found, however, because of properly timed controls. Beet webworm is considered one of the most destructive insects in Wyoming. Light trap collections in NORTH DAKOTA indicated the presence of large beet webworm adult populations, but, as was the case in 1962, there was virtually no larval activity on crops in the State.

BLACK CUTWORM (Agrotis ipsilon) ranged medium to heavy on sugar beets locally in Los Angeles and Butte Counties, CALIFORNIA. Unspecified CUTWORMS caused trace amounts of loss to sugar beets in COLORADO and were prevalent on the same host in CALIFORNIA.

POTATO FLEA BEETLE (Epitrix cucumeris) populations and damage on Swiss chard were light during June at Orono, Penobscot County, MAINE, and STRIPED FLEA BEETLE (Phyllotreta striolata) populations in WYOMING, were lower than those of 1962, with some damage occurring to seedling sugar beets during May and June in Fremont County. In NEVADA, damage to seedling sugar beets by unspecified FLEA BEETLES was severe in Pershing County and ranged light to medium in Washoe County in May. Infestations continued into July in these areas, but older beets suffered only light damage. In CALIFORNIA, two species of flea beetles (Hemiglyptus basalis and Epitrix sp.) caused some damage to plantings of sugar beets and other crops.

Adults of PACIFIC COAST WIREWORM (Limonius canus) were flying during mid-April in eastern WASHINGTON and damage to sugar beets was severe in Walla Walla County in May. Infestations of this species have been increasing on crops in Washington for the last several years. Limonius sp. caused slight feeding damage to sugar beets in WYOMING, the largest populations being found in Goshen, Washakie, Big Horn, Hot Springs and Fremont Counties. These 1963 populations were about the same as those present during the preceding year. This pest is among the more destructive insects in Wyoming.

SUGAR-BEET ROOT MAGGOT (Tetanops myopaeformis) was present only in trace numbers during the 1963 season in NORTH DAKOTA. Infestations of this pest in sugar beets were about the same as during 1962 in WYOMING, with only a small amount of damage being found and most infestations occurring in Washakie and Big Horn Counties. Sugar-beet root maggot caused trace amounts of loss to sugar beets in COLORADO and was approximately normal in numbers and damage in UTAH.

SPINACH LEAF MINER (Pegomya hyoscyami) infestations and damage on spinach and beets were moderate in the Scarboro and Cape Elizabeth areas of Cumberland County, MAINE, by mid-June. In late June, heavy infestations and damage were observed on beet greens in Berwick, York County, and light infestations and damage on spinach beets and Swiss chard were reported from Monmouth, Kennebec County. Heavy infestations and moderate damage by spinach leaf miner were found on beets and Swiss chard in the Presque Isle area of Aroostook County, Maine, in mid-July. This leaf miner fly had damaged spinach and chard in Kingston, Washington County, RHODE ISLAND, by June 12. Severe damage to table beet plants in Lane County, OREGON was probably caused by spinach leaf miner. An unusual infestation of this pest occurred on spinach in San Juan County, WASHINGTON, and the species was more severe than usual on sugar beets and spinach in eastern Washington. Pegomya sp. was heavy in garden beets and chard on the Kenai Peninsula of ALASKA.

An EPHYDRID FLY (Psilopa leucostoma) mined sugar beet foliage at Walla Walla, WASHINGTON, during the 1963 season.

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) migrated from clovers and other spring hosts to sugar beets and other crops in central WASHINGTON during the summer of 1963, with unseasonably hot weather promoting rapid buildup and damage. Unspecified SPIDER MITES were medium on maturing sugar beets in Churchill County, NEVADA, during late September and early October. An ACARID MITE (Tyrophagus dimidiatus) infestations were medium on spinach in Irvine, Orange County, and at Woodland, Yolo County, CALIFORNIA. In general, MITES were prevalent early on spinach and sugar beets in California, and as the summer progressed, truck crops were more generally infested. Weather was not conducive to a general buildup, however.

ARTICHOKE AND LETTUCE INSECTS

Highlights:

CABBAGE LOOPER on lettuce necessitated controls in New Mexico and Arizona, and controls were necessary on this crop in Arizona to prevent losses from TOMATO FRUITWORM, FALL ARMYWORM and BEET ARMYWORM. SIX-SPOTTED LEAFHOPPER damaged lettuce in Maine, and aster yellows, transmitted by this species, was below normal in New York and in Wisconsin. Infestations of ARTICHOKE PLUME MOTH and of a WEEVIL (Brachyrhinus cribricollis) were of some concern on artichoke in California during the 1963 season.

CABBAGE LOOPER (Trichoplusia ni) infestations ranged light to moderately heavy in lettuce fields in Dona Ana County, NEW MEXICO, and required control applications at regular intervals. Although parasites aided in keeping down large populations of this pest in ARIZONA, controls were still necessary on lettuce to prevent heavy losses. Larvae of TOMATO FRUITWORM (Heliothis zea) built up to damaging numbers in lettuce fields in Arizona during October and November, and continuous controls were essential to maintain relatively noneconomic populations. FALL ARMYWORM (Laphygma frugiperda) necessitated control efforts to reduce larval numbers in lettuce fields in the State, particularly in Yuma, Maricopa and Pinal Counties. BEET ARMYWORM (Spodoptera exigua) larvae caused considerable damage to lettuce fields in the southern portion of Arizona, averaging as high as 45 per 100 plants in some fields.

SIX-SPOTTED LEAFHOPPER (Macrosteles fascifrons) infestations were moderate but caused severe damage to head lettuce by late July in the Scarboro area of Cumberland County, MAINE. Moderate infestations were noted in Monmouth, Kennebec County, with damage by the second generation being moderate by the second week of August. Six-spotted leafhopper populations were normal on lettuce in NEW YORK, but aster-yellows disease, for which this species is a vector, was below normal. Six-spotted leafhopper adults were noted on rye April 9 in WISCONSIN, which is three weeks earlier than in 1962. Populations increased noticeably by the first week of May, at which time nymphs were becoming apparent. Although numerous throughout the season and observed into mid-November in Wisconsin during 1963, six-spotted leafhopper was not too viruliferous; however, at least one lettuce planting in Portage County became seriously infected with aster yellows.

A COREID BUG (Arhyssus scutatus) was heavy on lettuce in Oso Flaco, San Luis Obispo County, CALIFORNIA, and LYGUS BUGS (Lygus spp.) were a problem on lettuce and other crops in many locations in the State. A FALSE CHINCH BUG (Nysius sp.) ranged light to medium on lettuce in Santa Cruz County, California.

APHIDS were more numerous than usual on undersides of basal lettuce leaves in ALASKA, but caused no serious damage; however, SLUGS severely damaged lettuce in southeastern port areas of the State during the 1963 season.

Insect infestations of artichoke were of some concern in CALIFORNIA. ARTICHOKE PLUME MOTH (Platyptilia carduidactyla) was heavy on that crop in Santa Barbara and San Mateo Counties, medium on thistle in San Luis Obispo County, and was heavy locally on artichoke in Marin County. A WEEVIL (Brachyrhinus cribricollis) was heavy in artichoke plantings in Santa Maria, Santa Barbara County, during 1963.

CUCURBIT INSECTS

Highlights:

STRIPED CUCUMBER BEETLE was damaging in Maine, more destructive in Maryland than in several years, and heavy in Missouri. SQUASH BUG was heavy in southern Nevada and necessitated controls in most areas of Texas. THRIPS required controls in Texas and were destructive to several crops in Maryland.

STRIPED CUCUMBER BEETLE (Acalymma vittata) infestations and damage were reported as heavy in Auburn, Androscoggin County, MAINE, and from other areas of Androscoggin and Sagadahoc Counties in mid-June. Striped cucumber beetle was generally present over RHODE ISLAND during the 1963 season, with first adults being seen in Washington, Kent County, on June 5. The pest was less conspicuous in Rhode Island than it was in 1962. In NEW YORK, this beetle remained very light during the season. Striped cucumber beetle populations on young cucumbers, cantaloups and squash on the Eastern Shore of MARYLAND were the heaviest and most destructive in severeal years. Cucumber beetles, principally striped cucumber beetle, began appearing in large numbers in blacklight traps in Dane County, WISCONSIN, the first week of June, with noticeable damage to cucumbers and squash occurring during the next few weeks. Heavy infestations of striped cucumber beetle were reported on watermelons and cantaloups in west central and northwestern areas of MISSOURI during 1963.

SQUASH VINE BORER (*Melittia cucurbitae*) adults appeared in WISCONSIN during the last week of June; damage was evidently light, primarily in home gardens and on certain varieties of squash. The pest heavily damaged squash in Jefferson County, TEXAS, in 1963.

SQUASH BUG (*Anasa tristis*) populations were heavy in NEVADA, especially in the southern counties, where the species is the limiting factor in growing squash. Squash bug was below average in numbers or importance in UTAH this season, but necessitated the treatment of squash and melons in most areas of TEXAS. The bug was reported as feeding on truck crops and in gardens in MISSOURI, and was more of a pest in home gardens on the Eastern Shore of VIRGINIA than for the past several years. Several heavy infestations of squash bug were reported and observed on squash and pumpkins throughout MARYLAND during August. This species, in association with HORNED SQUASH BUG (*Anasa armigera*), injured squash and pumpkins at Havre de Grace, Harford County, Maryland.

LYGUS BUGS (*Lygus* spp.) were a problem on cucumbers and other crops in many locations over CALIFORNIA during 1963.

MELON APHID (*Aphis gossypii*) was more abundant than usual on cucurbits in OHIO, and ranged light to heavy on these crops in the winter garden area of Dimmit and Zavala Counties, TEXAS. Melon aphid was heavy on melons in Merced and San Joaquin Counties, CALIFORNIA, and light on squash in Yolo County.

POTATO LEAFHOPPER (*Empoasca fabae*) was considerably above normal and caused extensive damage to squash, pumpkins and other crops in most sections of MARYLAND during the 1963 season. Unspecified LEAFHOPPERS were a problem on melons, cantaloups and other crops in several localities over CALIFORNIA.

WESTERN FLOWER THRIPS (*Frankliniella occidentalis*) and ONION THRIPS (*Thrips tabaci*) were variable on melons and other crops in TEXAS, requiring controls in several areas of the State. Several species of THRIPS were destructive to cucumbers, cantaloups and other crops during the summer months in MARYLAND.

A LABIDURID EARWIG (*Euborellia cincticollis*) was fairly heavy on cantaloup fruit in Imperial County, CALIFORNIA.

Heavy numbers of a LEAF MINER FLY (*Liriomyza munda*) occurred on a wide variety of crops in TEXAS, including cantaloups and watermelons. Infestations in the winter garden area of Dimmit and Zavala Counties were sufficiently significant to justify controls. Heavy infestations of *Liriomyza* spp. occurred in cucurbits and other crops during the spring in FLORIDA. Infestations were heavier when an ineffective insecticide was used, than when no control was applied. Populations of these leaf miner flies were much lighter in the fall of the year in Florida.

ROOT MAGGOTS (*Hylemya* spp.) were a local problem on melon and cucumber plantings in San Joaquin County, CALIFORNIA, and late populations of a VINEGAR FLY (*Drosophila melanogaster*) developed in harvested melon fields in the State.

SPIDER MITES (*Tetranychus* spp.) were numerous and widespread during July and August on cantaloups, watermelons and other crops in MARYLAND, being especially serious in home gardens. MITES in general, were prevalent early in the season on melons in CALIFORNIA, and generally infested truck crops as the summer progressed. Weather in the State was not conducive to a rapid buildup.

CENTIPEDES were a problem on squash seedlings in the San Fernando Valley of Los Angeles County, CALIFORNIA.

CARROT AND CELERY INSECTS

CABBAGE LOOPER (*Trichoplusia ni*) and small numbers of other NOCTUID larvae were usually present in 10 to 30 percent of celery plants sampled during the fall in the Sanford area of Seminole County, FLORIDA, and caused light to medium damage.

A WEEVIL (*Hyperodes texana*) infested carrots in the Rio Grande Valley and a FALSE CHINCH BUG (*Nysius* sp.) infested the same host in localized areas of Hidalgo County, both in TEXAS. LYGUS BUGS (*Lygus* spp.) were a problem on carrots in many locations of CALIFORNIA.

SIX-SPOTTED LEAFHOPPER (*Macrosteles fascifrons*) was generally light on carrots in NEW YORK during the 1963 season, and aster-yellows disease, transmitted by this species, was below normal in the State. Unspecified LEAFHOPPERS were a problem on the same crop in several locations over CALIFORNIA.

Based on weekly samples from a commercial farm at Sanford, Seminole County, FLORIDA, a LEAF MINER FLY (*Liriomyza* sp.) infested most older celery plants, but tended to be sparse in younger plants. Damage varied from light to heavy.

SPRINGTAILS were numerous in low spots in fields in the Tanana Valley and on the Kenai Peninsula in ALASKA. The pests were sufficiently numerous in harvested celery in the Wasilla area of the Matanuska Valley that the crop was rejected upon inspection. Interiors of stalks were filled with eggs and adults, but there was no evidence of feeding.

SWEETPOTATO INSECTS

Severe freezes in the winters of 1962 and 1963 destroyed wild host plants and sweetpotato crop refuse which enable SWEETPOTATO WEEVIL (*Cylas formicarius elegantulus*) to overwinter in fields throughout the generally infested area. This natural phenomenon offered an unusual opportunity to delimit and to eliminate infestations. The northern boundary of the sweetpotato weevil infestation has been clearly established and substantial gains made in eliminating the pest. All infestations have been eradicated from a commercial production area near Jackson, MISSISSIPPI, and 400 of the original 500 infestations in the commercial area of southern GEORGIA have been eliminated. During the past two years, infestations have been eliminated from East Feliciana and West Feliciana Parishes, LOUISIANA, including the St. Francisville section where the largest sweetpotato market in the State is located. Only 39 infestations remained in ALABAMA, none of which are in commerical areas, and a substantial buffer zone has been established between commercial sweetpotatoes grown in northeastern TEXAS and the generally infested area to the south. Through vigorous control efforts, sweetpotato weevil populations have been substantially reduced in the remainder of the infested area.

SWEETPOTATO FLEA BEETLE (Chaetocnema confinis) adults caused noticeable leaf injury to sweetpotatoes during June on the Eastern Shore of MARYLAND, and caused severe damage to the same host in localized areas of the Eastern Shore of VIRGINIA during the same period. Larval damage to roots of sweetpotato by sweetpotato flea beetle continued to increase in SOUTH CAROLINA during 1963.

BANDED CUCUMBER BEETLE (Diabrotica balteata) ranged 0-70 per 100 sweeps on sweetpotatoes in East Baton Rouge, St. Martin, St. Landry, Acadia and Lafayette Parishes, LOUISIANA, during late August. Larvae were heavy in many fields, with controls being unsatisfactory.

SOUTHERN POTATO WIREWORM (Conoderus falli) and TOBACCO WIREWORM (C. vespertinus) damage to sweetpotatoes in NORTH CAROLINA appeared to be slightly less than that of 1962. Damage in the Benson-Newton Grove area of the State was very light in most fields and shallow holes were common on sweetpotatoes from some fields in southeastern counties. Damage by southern potato wireworm continued to increase on sweetpotatoes in SOUTH CAROLINA. Tobacco wireworm infestations ranged light to moderate on sweetpotatoes in southwestern GEORGIA during the 1963 season.

SWEETPOTATO HORNWORM (Agrius cingulatus) caused light to moderate defoliation of sweetpotatoes in southern GEORGIA, and infestations of VELVETBEAN CATERPILLAR (Anticarsia gemmatalis) were heavy on sweetpotato foliage in the southeastern portion of that State during the season.

BLACK CUTWORM (Agrotis ipsilon) and VARIEGATED CUTWORM (Peridroma saucia) injured several plantings of sweetpotatoes and other crops over MARYLAND during 1963, and MORNING-GLORY LEAF MINER (Bedellia somnulentella) was heavy on sweetpotatoes in the Oceanside area of San Diego County, CALIFORNIA.

STRAWBERRY INSECTS

Highlights:

ORANGE TORTRIX was of considerable importance on strawberries in California during most of the season. CYCLAMEN MITE was important on the crop throughout Minnesota, resulting in reduction of marketable berries. TWO-SPOTTED SPIDER MITE required extensive controls on strawberries in New Jersey.

STRAWBERRY LEAF ROLLER (Ancylis comptana fragariae) adults were abundant on small strawberry plantings in Whitman County, WASHINGTON, by early May, and the pest was about normal during the 1963 season in UTAH. Adult activity was very prevalent in Lancaster County, NEBRASKA, in late April, and infestations were above normal in ARKANSAS during the 1963 season. Strawberry leaf roller was normal in abundance on strawberries in NEW JERSEY and NEW YORK. Unspecified STRAWBERRY LEAF ROLLERS injured several old and new strawberry plantings on the Eastern Shore of MARYLAND. STALK BORER (Papaipema nebris) damaged strawberries in late June in Richmond and Charleston, Washington County, RHODE ISLAND.

ORANGE TORTRIX (Argyrotaenia citrana) was of considerable importance on strawberry over CALIFORNIA during most of the 1963 season there.

Moderate to heavy populations of STRAWBERRY WEEVIL (Anthonomus signatus) on home plantings of strawberries in the Orono area of Penobscot County, MAINE, caused moderate to heavy damage to plants. STRAWBERRY ROOT WEEVIL (Brachyrhinus ovatus) numbers and injury on strawberry were approximately normal in UTAH during 1963, but another WEEVIL (B. cribricollis) was medium locally on strawberry plantings in Orange County, CALIFORNIA. ROSE CHAFER (Macrodactylus subspinosus) infestations and damage on strawberries were moderate in some areas of York County, MAINE, during mid-July.

TARNISHED PLANT BUG (Lygus lineolaris) populations were unusually light on strawberry in NEW YORK but POTATO LEAFHOPPER (Empoasca fabae) was common. SPITTLEBUGS were normal on strawberry in NEW JERSEY, but were numerous in strawberry beds in southeastern ALASKA during the 1963 season.

STRAWBERRY APHID (Pentatrichopus fragaefolii) was generally light on strawberry in Orange County, CALIFORNIA. APHIDS, principally Pentatrichopus thomasi, ranged light to moderate on strawberries in all sections of MARYLAND during the season, and unspecified species were present on strawberries in normal numbers in NEW JERSEY.

CYCLAMEN MITE (Steneotarsonemus pallidus) infestations on strawberry in MAINE were, for the most part, limited to home plantings, with no problems being reported by commercial growers. Populations of this mite remained generally very low because of the dry season in Maine during 1963. Cyclamen mite was normal in abundance on strawberry during the season in NEW YORK, but posed a considerable problem on everbearing strawberries over the entire State of MINNESOTA, resulting in reduction of marketable yields of berries. This mite was below average in numbers and importance in UTAH, and was light on strawberries in Santa Barbara and Santa Clara Counties, CALIFORNIA.

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) was generally light in strawberry-growing areas of CALIFORNIA, with a few locally medium to heavy infestations reported. Two-spotted spider mite was observed on strawberries throughout NORTH DAKOTA, required extensive controls in NEW JERSEY and was somewhat heavier than usual in the western portion of NEW YORK during the season. EUROPEAN RED MITE (Panonychus ulmi) was heavy on strawberries in Santa Barbara County, CALIFORNIA. Unspecified SPIDER MITES were numerous on some strawberry plantings in the Matanuska Valley of ALASKA during the 1963 season in that State.

GARDEN SYMPHYLAN (Scutigerella immaculata) damaged strawberries in southwestern WASHINGTON, continuing into late July because of a cool, rainy season.

BRAMBLE INSECTS

JAPANESE BEETLE (Popillia japonica) adults were heavy on raspberries in sections of Queen Annes County, MARYLAND, in 1963. In RHODE ISLAND, local infestations of RASPBERRY CANE BORER (Oberea bimaculata) were present during early June in Providence County. A RASPBERRY FRUITWORM (Byturus rubi) was numerous on raspberries throughout the raspberry-growing areas of ALASKA; and a WEEVIL (Brachyrhinus sp.) caused some concern to processors in Multnomah County, OREGON, by infesting raspberries to the extent that adults could not be washed out of the finished product. STRAWBERRY CROWN MOTH (Ramosia bibionipennis) severely damaged red raspberry plants in Clark County, WASHINGTON, and a LEAF ROLLER MOTH (Platynota stultana) was a pest of bushberries in a few locations in CALIFORNIA during 1963. HEMISPHERICAL SCALE (Saissetia hemisphaerica) was sufficiently abundant on blackberries at Largo, Pinellas County, FLORIDA, to cause some economic damage. TWO-SPOTTED SPIDER MITE (Tetranychus telarius) populations in southwestern MICHIGAN fruit areas reached moderate to heavy levels in some cane berry and fruit plantings in July. Moderate populations of two-spotted spider mite were reported to have caused light to moderate damage to raspberries in Cumberland County, MAINE, early in August.

MISCELLANEOUS TRUCK AND GARDEN CROP INSECTS

CUTWORMS were of concern on truck and vegetable crops in various areas of the Nation during the 1963 season. FALL ARMYWORM (*Laphygma frugiperda*) damaged several vegetable crops on the Eastern Shore of *VIRGINIA* in early September. Populations of BEET ARMYWORM (*Spodoptera exigua*) were much more serious in the Bradenton area of Manatee County, *FLORIDA*, than usual during the season, being difficult to control with the usual insecticidal treatment. YELLOW-STRIPED ARMYWORM (*Prodenia ornithogalli*) caused heavy, widespread damage to various vegetables in the winter garden area of Dimmit and Zavala Counties, *TEXAS*. DINGY CUTWORM (*Feltia subgothica*), BLACK CUTWORM (*Agrotis ipsilon*) and VARIEGATED CUTWORM (*Peridroma saucia*) caused some damage during early spring in *MISSOURI*, but infestations were considerably lower in 1963 than in 1962. In *CALIFORNIA*, CABBAGE LOOPER (*Trichoplusia ni*) ranged light to heavy on most truck crops in all vegetable-growing areas most of the year, and black cutworm was medium on some truck crops in Chula Vista, San Diego County. Black cutworm, variegated cutworm, ALFALFA LOOPER (*Autographa californica*) and *Dargida procincta* heavily damaged all truck crops in the Willamette Valley of *OREGON* during May, June and July, necessitating chemical controls. Variegated cutworm was epidemic on most vegetable and some field crops throughout western *WASHINGTON* during the 1963 season, the problem being aggravated by growers who did not attempt control until the larvae were large. In *ALASKA*, populations of *Euxoa* spp. were severe only in the Hope area of Cook Inlet, where vegetable gardens were severely damaged. Unspecified CUTWORMS caused considerable damage in a few fields of vegetables on the Eastern Shore of *VIRGINIA* in early July and damaged several vegetable crops in the area during early September. Weekly surveys in *SOUTH CAROLINA* showed cutworms to be much less abundant in 1963 than in previous years. Cutworms were important vegetable pests in *MINNESOTA*, and occurred in gardens over *NORTH DAKOTA* where populations were heavy in some areas.

SALT-MARSH CATERPILLAR (*Estigmene acrea*) was damaging to some truck crops over *CALIFORNIA*, and an unspecified WOOLLYBEAR caused considerable damage to vegetables in Jefferson and Travis Counties, *TEXAS*. GARDEN WEBWORM (*Loxostege similalis*) was reported feeding on truck crops and in gardens in *MISSOURI* during the season.

Heavy populations of TARNISHED PLANT BUG (*Lygus lineolaris*) had caused moderate damage to general garden crops in the North Pownal-Scarboro area of Cumberland County, *MAINE*, by late July. GARDEN FLEAHOPPER (*Halticus bracteatus*) fed on truck crops and in gardens in *MISSOURI* during 1963.

THRIPS were abundant generally on cultivated and wild hosts in *CALIFORNIA*, vegetable and truck crops being generally infested as well. SPINACH LEAF MINER (*Pegomya hyoscyami*) was generally normal in numbers and/or injury in *UTAH*. A LEAF MINER FLY (*Liriomyza* sp.) infested a wide variety of crops, including okra, in the winter garden area of Dimmit and Zavala Counties, *TEXAS*. These infestations required the application of control measures. TEXAS LEAF-CUTTING ANT (*Atta texana*) was heavy in localized areas of Washington County, Texas.

GRASSHOPPERS were considered the number one pests of gardens throughout *MISSOURI* during the 1963 season, because of the high number of reports received concerning infestations of *Melanoplus* spp. in these habitats. Many species of grasshoppers damaged various garden crops to a varying degree over *TEXAS*, and caused extensive damage to truck crops and home gardens in Bernalillo, Sandoval and Valencia Counties, *NEW MEXICO*, during June. In *CALIFORNIA*, grasshoppers caused local damage to truck crops in Stanislaus County, and FIELD CRICKETS (*Gryllus* spp.) ranged medium to heavy on truck crop plantings in Imperial County.

EUROPEAN EARWIG (*Forficula auricularia*) was more of a problem in home gardens than commerical plantings in *CALIFORNIA* during 1963, and damaged vegetables in home gardens in one area of Santa Fe, Santa Fe County, *NEW MEXICO*. European earwig is increasing on truck crops in western portions of *MONTANA*.

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) was generally light on truck crops in CALIFORNIA during the 1963 season, and was not the problem it has been in the past. SPIDER MITES occurred on truck crops and in gardens in MISSOURI, and caused considerable damage to vegetable crops on the Eastern Shore of VIRGINIA during August and September.

Adult SIX-SPOTTED LEAFHOPPER (Macrosteles fascifrons) collections were made during mid-May in MICHIGAN, which is earlier than has been reported during recent years. Below freezing temperature in many areas of the State on June 21 and 22 appeared to have greatly reduced populations. Commercial problems with aster yellows during the season were low in Michigan.

GARDEN SYMPHYLAN (Scutigerella immaculata) damage to vegetable crops continued high in irrigated areas of western OREGON in 1963, but unspecified SYPHYLANS were below average in numbers or importance in UTAH during the season.

UNITED STATES DEPARTMENT OF AGRICULTURE
Hyattsville, Maryland 20781

OFFICIAL BUSINESS

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF AGRICULTURE

U. S. Dept. of Agr.
National Agricultural Library
Beltsville Branch
11-27-63 Plant Industry Station
IPS Beltsville, Md. 20705